

# PCOM-B216VG-VI

## COM Express Type VI Module

### User's Manual



Version 1.0

Copyright © Portwell, Inc., 2010. All rights reserved.  
All other brand names are registered trademarks of their respective owners.

## How to Use This Manual

The manual describes how to configure your PCOM-B216VG-VI to meet various operating requirements. It is divided into five chapters, with each chapter addressing a basic concept and operation of this COM Express Module.

**Chapter 1 : System Overview.** Presents what you have in the box and give you an overview of the product specifications and basic system architecture for this model of single board computer.

**Chapter 2 : Hardware Configuration.** Shows the definition and location of Jumpers and Connectors that you can easily configure your system.

**Chapter 3 : System Installation.** Describes how to properly mount the CPU, main memory to get a safe installation and provides a programming guide of Watch Dog Timer function.

**Chapter 4 : BIOS Setup Information.** Specifies the meaning of each setup parameters, how to get advanced BIOS performance and update new BIOS. In addition, POST checkpoint list will give users some guidelines of trouble-shooting.

The content of this manual and EC declaration document is subject to change without prior notice. These changes will be incorporated in new editions of the document. **Portwell** may make supplement or change in the products described in this document at any time.

Updates to this manual, technical clarification, and answers to frequently asked questions will be shown on the following web site: <http://www.portwell.com.tw>

# Chapter 1

## System Overview

### 1.1 Introduction

COM Express Type 6, have not holds by PICMG (PCI Industrial Computer Manufacturer Group) yet but they will defines new industrial computer platform in “Module board” and “Carrier board” architecture. The “Module board” equipped processor or its socket, chipset, memory or memory socket and single Ethernet controller on it. The On-The-Shelf Module board allows users to create their own Carrier board easily and quickly since most critical parts are ready on Module board. COM Express Module board offers expansion interfaces such as PCI Express, PCI, SATA, IDE, LPC, LVDS, HDMI, DP, DVI, and Audio etc. that could support variety functions depending on Carrier board design.

The Carrier board was customized design to fit in different mechanical requirements. In the meanwhile, its variety functions were also customized to meet the application. Compares to the platform that designed from nothing, COM Express architecture platform only needs to develop Carrier board. Users could keep their know-how which related to their core competence in the Carrier board.

PCOM-B216VG-VI is Type VI COM Express Module board equipped Intel Arrandale BGA processor (Core i7-610E/ i7-620LE/ i7-620UE/ Core i5-520E and Celeron P4505 processor on-board), two DDR3 SO-DIMM sockets, one Gigabit Ethernet controller on it to provide expansion interfaces – PCI Express (x16 / x1), Three Multiple display ports (supports SDVO/HDMI/DP/DVI), SATA and so on.

### 1.2 Check List

The PCOM-B216VG-VI series package should cover the following basic items

- ✓ One PCOM-B216VG-VI module board

If any of these items is damaged or missing, please contact your vendor and keep all packing materials for future replacement and maintenance.

## 1.3 Product Specification

- **Main processor**

- Intel® Core i7-610E	SV	(4M Cache, 2.53GHz)
Core i7-620LE	LV	(4M Cache, 2.00GHz)
Core i7-620UE	ULV	(4M Cache, 1.06GHz)
Core i5-520E	SV	(3M Cache, 2.40GHz)
Celeron P4505	SV	(2M Cache, 1.86GHz)

- DMI x4 Link: 4.8GT/s (Full-Duplex)

- **BIOS**

AMI UEFI Aptio system BIOS in SPI ROM with 4MB Flash ROM with easy upgrade function ACPI, DMI, Green function and Plug and Play Compatible

- **Main Memory**

Two SO-DIMM sockets support dual channel DDR3 800/1066 up to 8GB

- **L2 Cache Memory**

Build-in processor

- **Chipset**

Intel QM57 chipset

- **Expansion Interfaces**

- PCI Express

- One PCI Express x16 link
- Seven PCI Express x1 link

- LVDS

- Supports 25 to 112MHz single/ dual channel LVDS interface
- Single channel LVDS interface support: 1 x 18 bpp or 24 bpp, compatible with VESA LVDS color mapping.
- Dual channel LVDS interface support: 2 x 18 bpp or 24 bpp
- Compatible with SPWG(Standard Panels Working Group) v.3.5 specification

- SDVO (Serial Digital Video Output)

- One SDVO ports are supported (multiplex pins with HDMI/DP at Port B)

- VGA

- Up to 2048 x 1536 mode support

- Ethernet

- Intel 82577LM Gigabit Ethernet controller is equipped, 4 MDI pairs on Row A- B

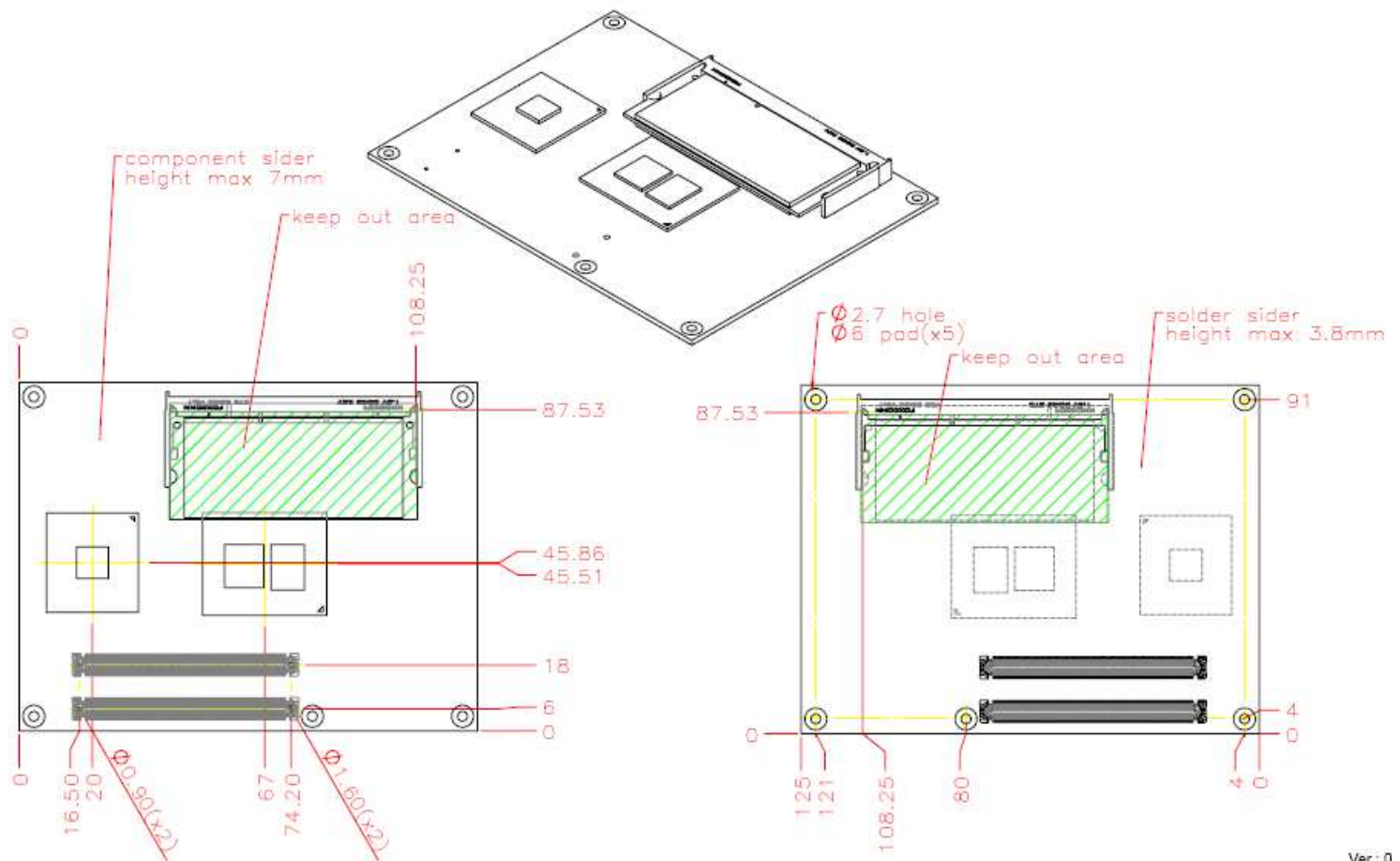
- SATA Interface

- Support Three SATA 300 ports and one eSATA port

- USB Interface

- Support eight USB 2.0 ports
- **Outline Dimension (L X W):**  
95mm (3.74") X 125mm (4.92")
- **Operating Temperature:**  
0°C ~ 60°C (32°F ~ 140°F)
- **Storage Temperature:**  
-20°C ~ 80°C
- **Relative Humidity:**  
5% ~ 90%, non-condensing

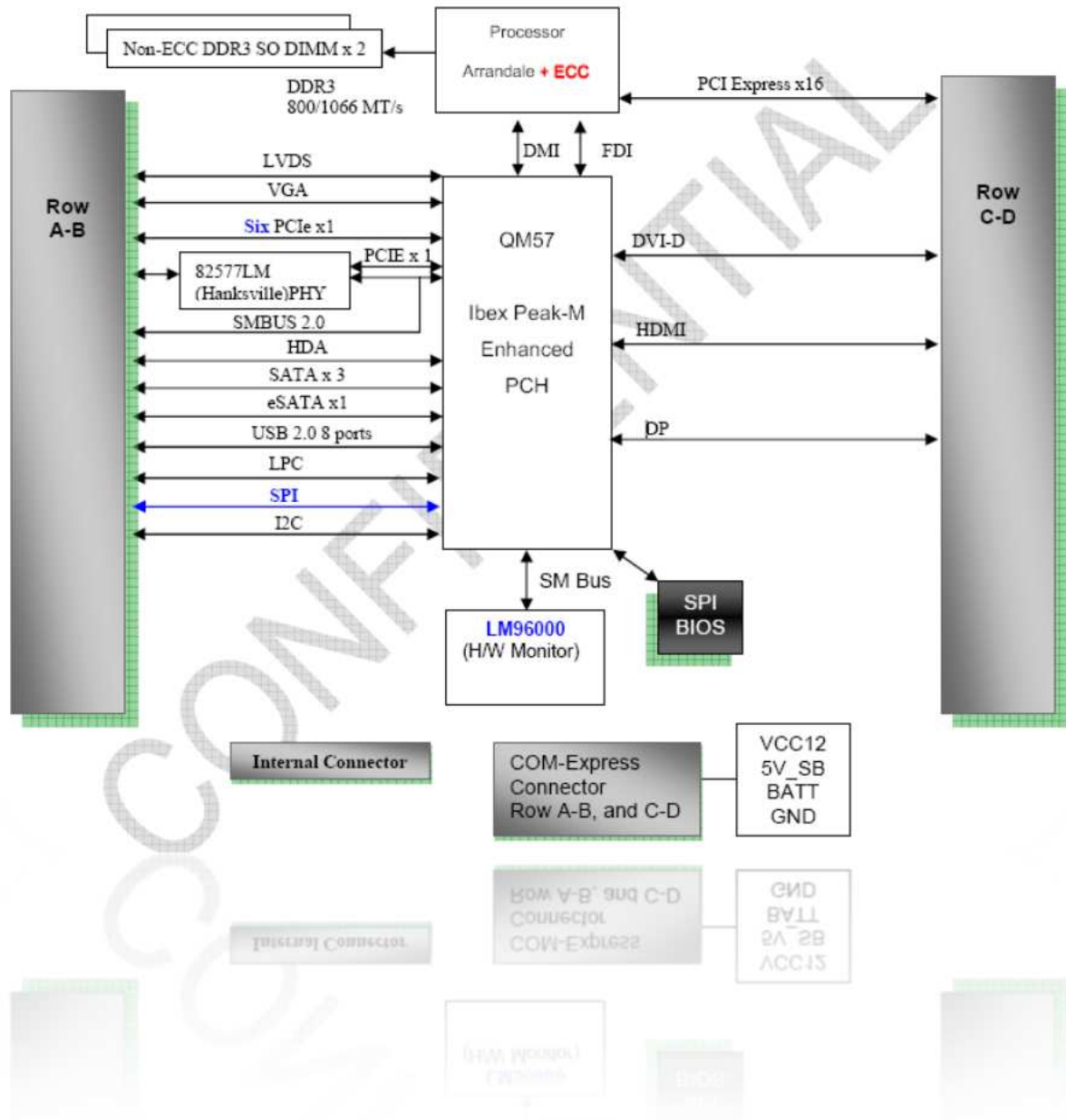
## 1.4 Mechanical Drawing



Ver: 0

## 1.5 System Architecture

**PCOM-B216VG-VI Block Diagram**



**PCOM-B216VG-VI Series System Block Diagram**

## Chapter 2

### Hardware Configuration

This chapter indicates jumpers', headers' and connectors' locations. Users may find useful information related to hardware settings in this chapter. The default settings are indicated with a star sign (★).

#### 2.1 Jumper Setting

In order to customize PCOM-B216VG-VI's features for users, in the following sections, **Short** means covering a jumper cap over jumper pins; **Open** or **N/C** (Not Connected) means removing a jumper cap from jumper pins. Users can refer to Figure 2-1 and Figure 2-2 for the Jumper locations.

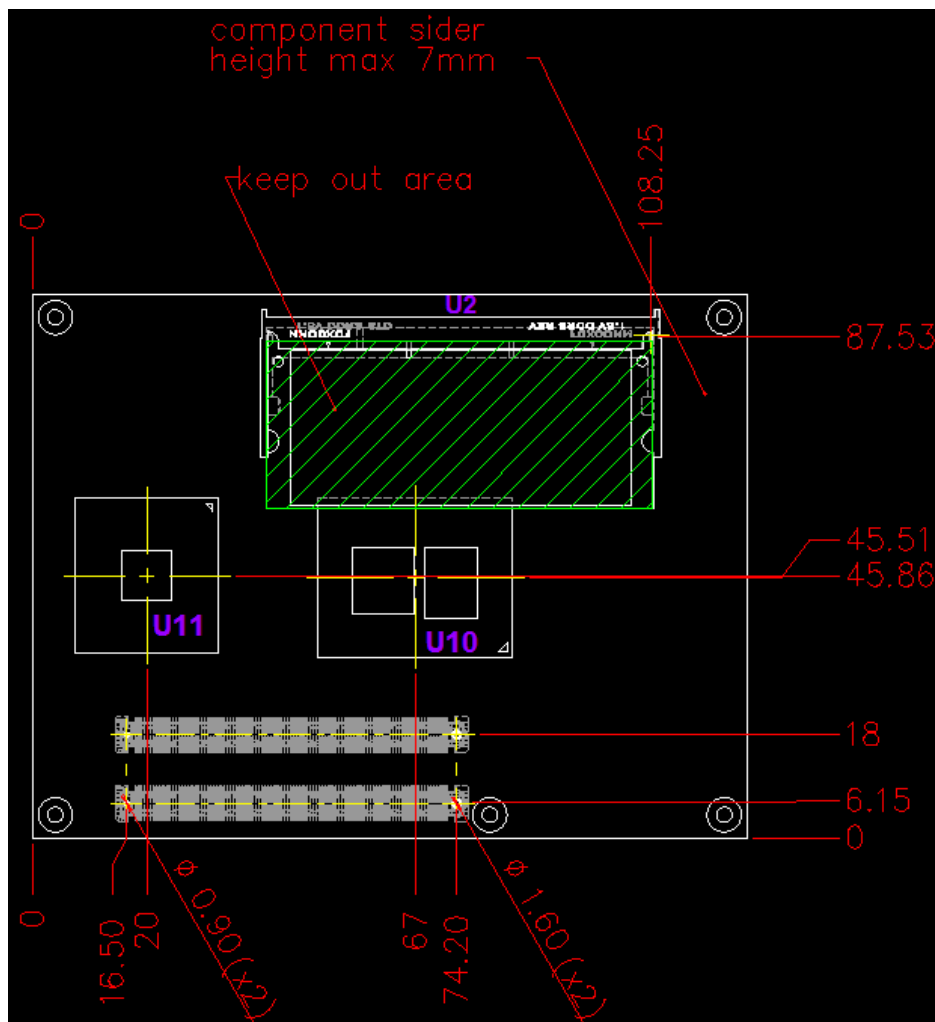


Figure 2-1 PCOM-B216VG-VI Top-side Connector Location



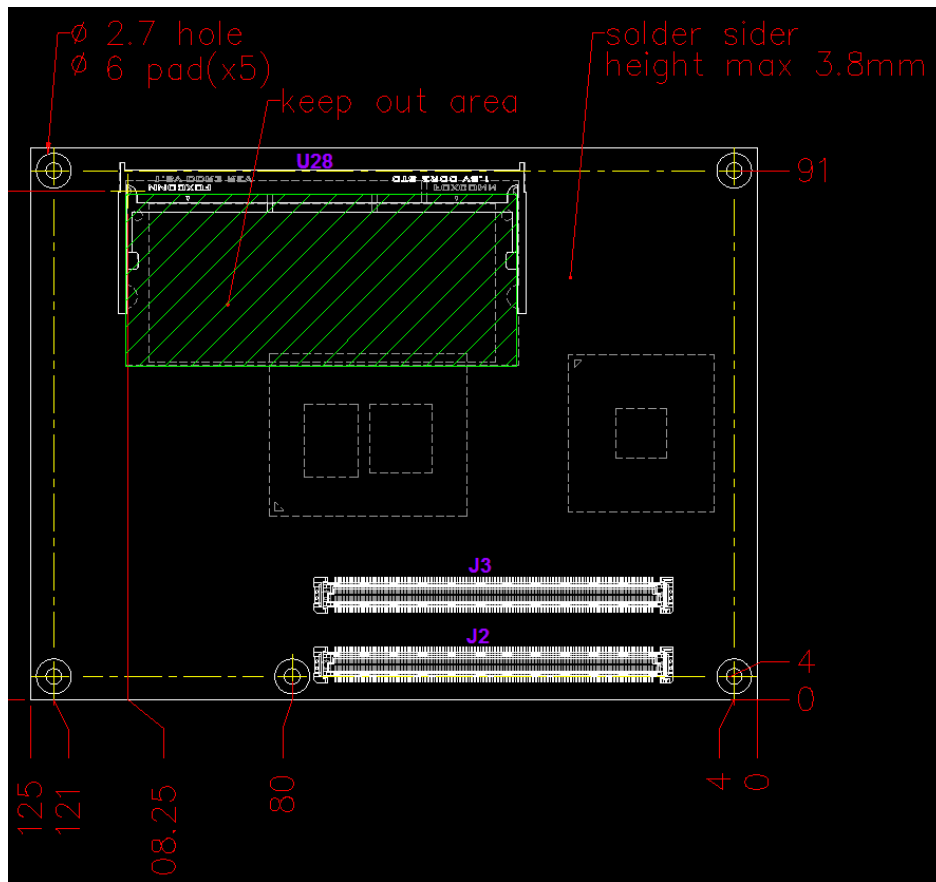


Figure 2-2 PCOM-B216VG-VI Bottom-side Connector Location

## 2.2 Connector Allocation

### Connector Function List

Connector	Function	Remark
U28	DDR3 channel A connector. To enable IAMT function, memory module must install to this connector if one RAM module only.	
U2	DDR3 channel B connector.	
J3	COM Express connector raw A and B	
J2	COM Express connector raw C and D	

### Pin Assignment of Connectors

J3				J2			
Row A		Row B		Row C		Row D	
Pin No	Signal Description	Pin No	Signal Description	Pin No	Signal Description	Pin No	Signal Description
A1	GND (FIXED)	B1	GND (FIXED)	C1	GND (FIXED)	D1	GND (FIXED)
A2	GBE0_MDI3-	B2	GBE0_ACT#	C2	GND	D2	GND
A3	GBE0_MDI3+	B3	LPC_FRAME#	C3	USB0_SSRX-	D3	USB0_SSTX-
A4	GBE0_LINK100#	B4	LPC_AD0	C4	USB0_SSRX+	D4	USB0_SSTX+
A5	GBE0_LINK1000#	B5	LPC_AD1	C5	GND	D5	GND
A6	GBE0_MDI2-	B6	LPC_AD2	C6	USB1_SSRX-	D6	USB1_SSTX-
A7	GBE0_MDI2+	B7	LPC_AD3	C7	USB1_SSRX+	D7	USB1_SSTX+
A8	GBE0_LINK#	B8	LPC_DRQ0#	C8	GND	D8	GND
A9	GBE0_MDI1-	B9	LPC_DRQ1#	C9	USB2_SSRX-	D9	USB2_SSTX-
A10	GBE0_MDI1+	B10	LPC_CLK	C10	USB2_SSRX+	D10	USB2_SSTX+
A11	GND (FIXED)	B11	GND (FIXED)	C11	GND (FIXED)	D11	GND (FIXED)
A12	GBE0_MDI0-	B12	PWRBTN#	C12	USB3_SSRX-	D12	USB3_SSTX-
A13	GBE0_MDI0+	B13	SMB_CK	C13	USB3_SSRX+	D13	USB3_SSTX+
A14	GBE0_CTREF	B14	SMB_DAT	C14	GND	D14	GND
A15	SUS_S3#	B15	SMB_ALERT#	C15	SDVO1_FLDSTAL L+	D15	RSVD
A16	SATA0_TX+	B16	SATA1_TX+	C16	SDVO1_FLDSTAL L-	D16	RSVD
A17	SATA0_TX-	B17	SATA1_TX-	C17	RSVD	D17	RSVD
A18	SUS_S4#	B18	SUS_STAT#	C18	RSVD	D18	RSVD
A19	SATA0_RX+	B19	SATA1_RX+	C19	PCIE_RX6+	D19	PCIE_TX6+
A20	SATA0_RX-	B20	SATA1_RX-	C20	PCIE_RX6-	D20	PCIE_TX6-
A21	GND (FIXED)	B21	GND (FIXED)	C21	GND (FIXED)	D21	GND (FIXED)
A22	SATA2_TX+	B22	SATA3_TX+	C22	PCIE_RX7+	D22	PCIE_TX7+
A23	SATA2_TX-	B23	SATA3_TX-	C23	PCIE_RX7-	D23	PCIE_TX7-
A24	SUS_S5#	B24	PWR_OK	C24	DP1_HPD	D24	RSVD
A25	SATA2_RX+	B25	SATA3_RX+	C25	SDVO1_INT+	D25	RSVD
A26	SATA2_RX-	B26	SATA3_RX-	C26	SDVO1_INT-	D26	DP1_LANE0/SDVO1_RE D+
A27	BATLOW#	B27	WDT	C27	DP1_AUX	D27	DP1_LANE0#/SDVO1_RE D-
A28	ATA_ACT#	B28	HDA_SDIN2	C28	DP1_AUX#	D28	RSVD
A29	HDA_SYNC	B29	HDA_SDIN1	C29	SDVO1_TVCLKIN +	D29	DP1_LANE1/SDVO1_G R N+
A30	AHDA_RST#	B30	HDA_SDIN0	C30	SDVO1_TVCLKIN -	D30	DP1_LANE1#/SDVO1_G R N-
A31	GND (FIXED)	B31	GND (FIXED)	C31	GND (FIXED)	D31	GND (FIXED)
A32	HDA_BITCLK	B32	SPKR	C32	DP2_AUX	D32	DP1_LANE2/SDVO1_BL U+
A33	HDA_SDOUT	B33	I2C_CK	C33	DP2_AUX#	D33	DP1_LANE2#/SDVO1_BL U-
A34	BIOS_DISABLE#	B34	I2C_DAT	C34	HDMI2_CLRLCLK	D34	HDMI2_CLRLDATA

A35	THRMTRIP#	B35	THRM#	C35	RSVD	D35	RSVD
A36	USB6-	B36	USB7-	C36	DP3_AUX	D36	DP1_LANE3/SDVO1_C K
A37	USB6+	B37	USB7+	C37	DP3_AUX#	D37	DP1_LANE3#/SDVO1 C K-
A38	USB_6_7_OC#	B38	USB_4_5_OC#	C38	HDMI3_CLTRCLK	D38	HDMI3_CTRLDATA
A39	USB4-	B39	USB5-	C39	DP3_LANE0	D39	DP2_LANE0
A40	USB4+	B40	USB5+	C40	DP3_LANE0#	D40	DP2_LANE0#
A41	GND (FIXED)	B41	GND (FIXED)	C41	GND (FIXED)	D41	GND (FIXED)
A42	USB2-	B42	USB3-	C42	DP3_LANE1	D42	DP2_LANE1
A43	USB2+	B43	USB3+	C43	DP3_LANE1#	D43	DP2_LANE1#
A44	USB_2_3_OC#	B44	USB_0_1_OC#	C44	DP3_HPD	D44	DP2_HPD
A45	USB0-	B45	USB1-	C45	RSVD	D45	RSVD
A46	USB0+	B46	USB1+	C46	DP3_LANE2	D46	DP2_LANE2
A47	VCC_RTC	B47	EXCD1_PERST#	C47	DP3_LANE2#	D47	DP2_LANE2#
A48	EXCD0_PERST#	B48	EXCD1_CPPE#	C48	RSVD	D48	RSVD
A49	EXCD0_CPPE#	B49	SYS_RESET#	C49	DP3_LANE3	D49	DP2_LANE3
A50	LPC_SERIRQ	B50	CB_RESET#	C50	DP3_LANE3#	D50	DP2_LANE3#
A51	GND (FIXED)	B51	GND (FIXED)	C51	GND (FIXED)	D51	GND (FIXED)
A52	PCIE_TX5+	B52	PCIE_RX5+	C52	PEG_RX0+	D52	PEG_TX0+
A53	PCIE_TX5-	B53	PCIE_RX5-	C53	PEG_RX0-	D53	PEG_TX0-
A54	GPI0	B54	GPO1	C54	TYPE0#	D54	PEG_LANE_RV#
A55	PCIE_TX4+	B55	PCIE_RX4+	C55	PEG_RX1+	D55	PEG_TX1+
A56	PCIE_TX4-	B56	PCIE_RX4-	C56	PEG_RX1-	D56	PEG_TX1-
A57	GND	B57	GPO2	C57	TYPE1#	D57	TYPE2#
A58	PCIE_TX3+	B58	PCIE_RX3+	C58	PEG_RX2+	D58	PEG_TX2+
A59	PCIE_TX3-	B59	PCIE_RX3-	C59	PEG_RX2-	D59	PEG_TX2-
A60	GND (FIXED)	B60	GND (FIXED)	C60	GND (FIXED)	D60	GND (FIXED)
A61	PCIE_TX2+	B61	PCIE_RX2+	C61	PEG_RX3+	D61	PEG_TX3+
A62	PCIE_TX2-	B62	PCIE_RX2-	C62	PEG_RX3-	D62	PEG_TX3-
A63	GPI1	B63	GPO3	C63	RSVD	D63	RSVD
A64	PCIE_TX1+	B64	PCIE_RX1+	C64	RSVD	D64	RSVD
A65	PCIE_TX1-	B65	PCIE_RX1-	C65	PEG_RX4+	D65	PEG_TX4+
A66	GND	B66	WAKE0#	C66	PEG_RX4-	D66	PEG_TX4-
A67	GPI2	B67	WAKE1#	C67	RSVD	D67	GND
A68	PCIE_TX0+	B68	PCIE_RX0+	C68	PEG_RX5+	D68	PEG_TX5+
A69	PCIE_TX0-	B69	PCIE_RX0-	C69	PEG_RX5-	D69	PEG_TX5-
A70	GND (FIXED)	B70	GND (FIXED)	C70	GND (FIXED)	D70	GND (FIXED)
A71	LVDS_A0+	B71	LVDS_B0+	C71	PEG_RX6+	D71	PEG_TX6+
A72	LVDS_A0-	B72	LVDS_B0-	C72	PEG_RX6-	D72	PEG_TX6-
A73	LVDS_A1+	B73	LVDS_B1+	C73	SDVO_DATA	D73	SDVO_CLK
A74	LVDS_A1-	B74	LVDS_B1-	C74	PEG_RX7+	D74	PEG_TX7+
A75	LVDS_A2+	B75	LVDS_B2+	C75	PEG_RX7-	D75	PEG_TX7-
A76	LVDS_A2-	B76	LVDS_B2-	C76	GND	D76	GND
A77	LVDS_VDD_EN	B77	LVDS_B3+	C77	RSVD	D77	IDE_CBLID#
A78	LVDS_A3+	B78	LVDS_B3-	C78	PEG_RX8+	D78	PEG_TX8+
A79	LVDS_A3-	B79	LVDS_BKLT_EN	C79	PEG_RX8-	D79	PEG_TX8-
A80	GND (FIXED)	B80	GND (FIXED)	C80	GND (FIXED)	D80	GND (FIXED)
A81	LVDS_A_CK+	B81	LVDS_B_CK+	C81	PEG_RX9+	D81	PEG_TX9+
A82	LVDS_A_CK-	B82	LVDS_B_CK-	C82	PEG_RX9-	D82	PEG_TX9-
A83	LVDS_I2C_CK	B83	LVDS_BKLT_CTRL	C83	RSVD	D83	RSVD
A84	LVDS_I2C_DAT	B84	VCC_5V_SBY	C84	GND	D84	GND
A85	GPI3	B85	VCC_5V_SBY	C85	PEG_RX10+	D85	PEG_TX10+
A86	KBD_RST#	B86	VCC_5V_SBY	C86	PEG_RX10-	D86	PEG_TX10-
A87	KBD_A20GATE	B87	VCC_5V_SBY	C87	GND	D87	GND
A88	PCIE0_CK_REF+	B88	SPI_CS1#	C88	PEG_RX11+	D88	PEG_TX11+
A89	PCIE0_CK_REF-	B89	VGA_RED	C89	PEG_RX11-	D89	PEG_TX11-
A90	GND (FIXED)	B90	GND (FIXED)	C90	GND (FIXED)	D90	GND (FIXED)
A91	SPI_CS0#	B91	VGA_GRN	C91	PEG_RX12+	D91	PEG_TX12+
A92	SPI_MISO	B92	VGA_BLU	C92	PEG_RX12-	D92	PEG_TX12-
A93	GPO0	B93	VGA_HSYNC	C93	GND	D93	GND
A94	SPI_CLK	B94	VGA_VSYNC	C94	PEG_RX13+	D94	PEG_TX13+
A95	SPI_MOSI	B95	VGA_I2C_CK	C95	PEG_RX13-	D95	PEG_TX13-
A96	GND	B96	VGA_I2C_DAT	C96	GND	D96	GND
A97	VCC_12V	B97	RSVD	C97	RSVD	D97	PEG_ENABLE#
A98	VCC_12V	B98	RSVD	C98	PEG_RX14+	D98	PEG_TX14+
A99	VCC_12V	B99	RSVD	C99	PEG_RX14-	D99	PEG_TX14-

A100	GND (FIXED)	B100	GND (FIXED)	C100	<b>GND (FIXED)</b>	D100	<b>GND (FIXED)</b>
A101	VCC_12V	B101	VCC_12V	C101	<b>PEG_RX15+</b>	D101	<b>PEG_TX15+</b>
A102	VCC_12V	B102	VCC_12V	C102	<b>PEG_RX15-</b>	D102	<b>PEG_TX15-</b>
A103	VCC_12V	B103	VCC_12V	C103	<b>GND</b>	D103	<b>GND</b>
A104	VCC_12V	B104	VCC_12V	C104	<b>VCC_12V</b>	D104	<b>VCC_12V</b>
A105	VCC_12V	B105	VCC_12V	C105	<b>VCC_12V</b>	D105	<b>VCC_12V</b>
A106	VCC_12V	B106	VCC_12V	C106	<b>VCC_12V</b>	D106	<b>VCC_12V</b>
A107	VCC_12V	B107	VCC_12V	C107	<b>VCC_12V</b>	D107	<b>VCC_12V</b>
A108	VCC_12V	B108	VCC_12V	C108	<b>VCC_12V</b>	D108	<b>VCC_12V</b>
A109	VCC_12V	B109	VCC_12V	C109	<b>VCC_12V</b>	D109	<b>VCC_12V</b>
A110	GND (FIXED)	B110	GND (FIXED)	C110	<b>GND (FIXED)</b>	D110	<b>GND (FIXED)</b>

## Chapter 3

### System Installation

This chapter could provide you with instructions to set up your system. The additional information is enclosed to help you for setting up on-board device.

#### 3.1 Intel®Core™ i7-610E/620LE/620UE, i5-520E, Celeron P4505 BGA processor

##### Configuring System Bus

PCOM-B216VG-VI series support SV/LV/ULV processor:

Intel ® Core i7-610E Processor,  
Intel ® Core i7-620LE Processor,  
Intel ® Core i7-620UE Processor,  
Intel ® Core i5-520E Processor,  
Intel ® Celeron P4505 Processor,

#### 3.2 Main Memory

PCOM-B216VG-VI provide 2 x 204pin SO-DIMM sockets which supports 800/1066 DDR3-SDRAM as main memory, Non-ECC (Error Checking and Correcting), non-register functions. The maximum memory can be up to 8GB. Memory clock and related settings can be detected by BIOS via SPD interface.

For system compatibility and stability, do not use memory module without brand. Memory configuration can be set to either one double-sided DIMM in one DIMM socket or two single-sided SO-DIMM in both sockets.

Beware of the connection and lock integrity from memory module to socket. Inserting improperly it will affect the system reliability. Before locking, make sure that all modules have been fully inserted into the card slots.

Memory Frequency	Single Channel DDR Bandwidth
800	12.8 GB/s
1066	17 GB/s

##### **Note:**

To insure the system stability, please do not change any of DRAM parameters in BIOS setup to modify system the performance without acquired technical information.

### 3.3 Installing System

To install your PCOM-B216VG-VI into standard chassis or proprietary environment, please perform the following:

Step 1: Check all jumpers setting on proper position

Step 2: Install and configure CPU and memory module on right position

Step 3: Place PCOM-B216VG-VI into the dedicated position in the system

Step 4: Attach cables to existing peripheral devices and secure it

#### **WARNING**

Please ensure that SBC is properly inserted and fixed by mechanism.

#### **Note:**

Please refer to section 3.3.1 to 3.3.7 to install INF/VGA/LAN/Audio drivers.

#### **Chipset Component Driver**

PCOM-B216VG-VI uses state-of-art Intel® QM57 chipset. It's a new chipset that some old operating systems might not be able to recognize. To overcome this compatibility issue, for Windows Operating Systems such as Windows 2000 /XP, please install its INF before any of other Drivers are installed. You can find very easily this chipset component driver in PCOM-B216VG-VI CD-title.

#### **Intel Integrated Graphics GMCH Chip**

PCOM-B216VG-VI uses Intel® QM57 integrated graphic chipset to gain an outstanding graphic performance. Shared 8 accompany it to 128MB system DDR3-SDRAM with Total Graphics Memory. PCOM-B216VG-VI supports VGA, DVI, LVDS and LVDS dual display. This combination makes PCOM-B216VG-VI an excellent piece of multimedia hardware.

With no additional video adaptor, this onboard video will usually be the system display output. By adjusting the BIOS setting to disable on-board VGA, an add-on PCI-Express by 1 VGA card can take over the system display.

### **Drivers Support**

Please find all the drivers in the PCOM-B216VG-VI CD-title. Drivers support Windows-2000, Windows XP.

#### **Intel® PROSet Gigabit Ethernet Controller**

##### **Drivers Support**

Please find INTEL 82577LM LAN driver in /Ethernet directory of PCOM-B216VG-VI CD-title. The drivers support Windows 2000 /XP/Vista/Win7.

#### **Audio Controller**

Please find Intel® High Definition Audio driver from PCOM-B216VG-VI CD-title. The drivers support Windows 2000 /XP/Vista/Win7.

#### **Intel® Active Management Technology (Intel® AMT)**

Please find the latest Intel® 6.0 driver from PCOM-B216VG-VI CD-title. The drivers support Windows 2000 /XP/Vista/Win7.

## **3.4 Clear CMOS Operation**

There is no backup battery design on module, therefore, all settings will be lost if disconnect PCOM-B216VG-VI Series with its carrier board.





## Chapter 4

### BIOS Setup Information

PCOM-B216VG-VI is equipped with the AMI UEFI Aptio BIOS stored in Flash ROM. These BIOS has a built-in Setup program that allows users to modify the basic system configuration easily. This type of information is stored in CMOS RAM so that it is retained during power-off periods. When system is turned on, PCOM-B216VG-VI communicates with peripheral devices and checks its hardware resources against the configuration information stored in the CMOS memory. If any error is detected, or the CMOS parameters need to be initially defined, the diagnostic program will prompt the user to enter the SETUP program. Some errors are significant enough to abort the start up.

#### 4.1 Entering Setup -- Launch System Setup

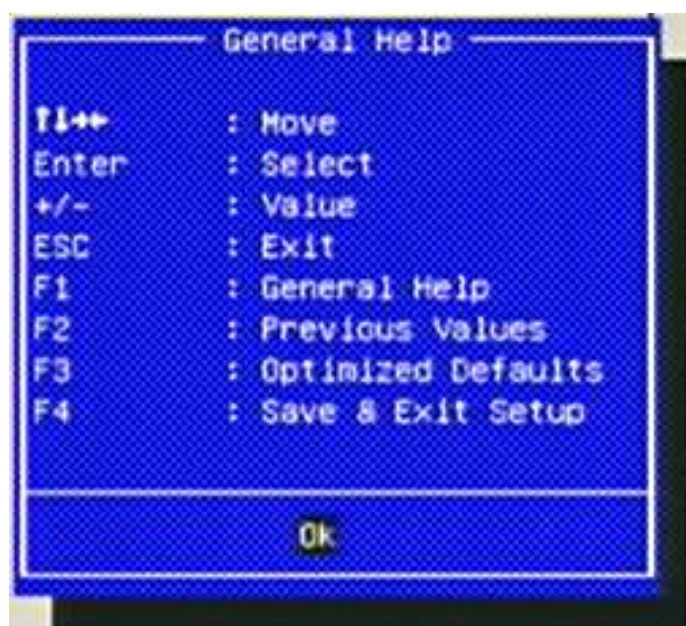
Power on the computer and the system will start POST (Power On Self Test) process. When the message below appears on the screen, press <Del> key will enter BIOS setup screen

Press <Del> to enter SETUP

If the message disappears before responding and still wish to enter Setup, please restart the system by turning it OFF and On or pressing the RESET button. It can be also restarted by pressing <Ctrl>, <Alt>, and <Delete> keys on keyboard simultaneously.

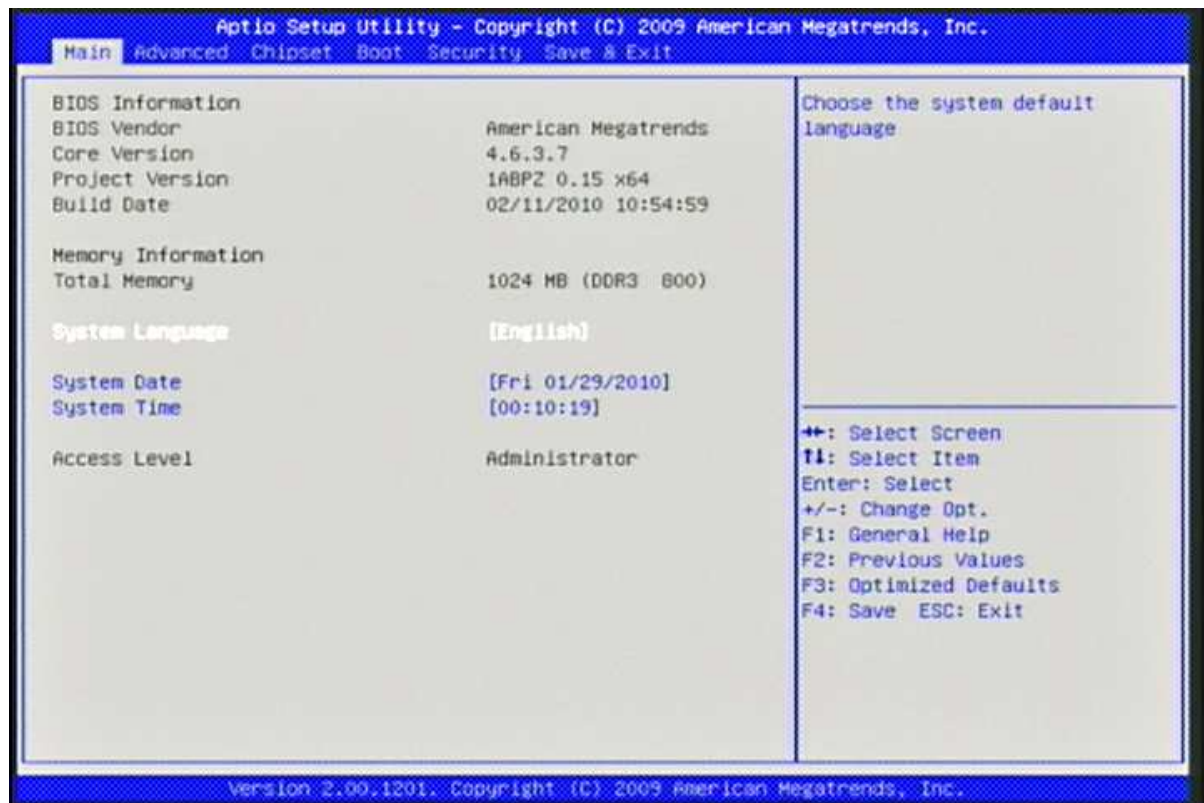
Press <F1> to Run SETUP or Resume

The BIOS setup program provides a General Help screen. The menu can be easily called up from any menu by pressing <F1>. The Help screen lists all the possible keys to use and the selections for the highlighted item. Press <Esc> to exit the Help screen.



## 4.2 Main

Use this menu for basic system configurations, such as time, date etc.



### BIOS Information, Memory Information

These items show the firmware and memory specifications of your system. Read only.

### System Time

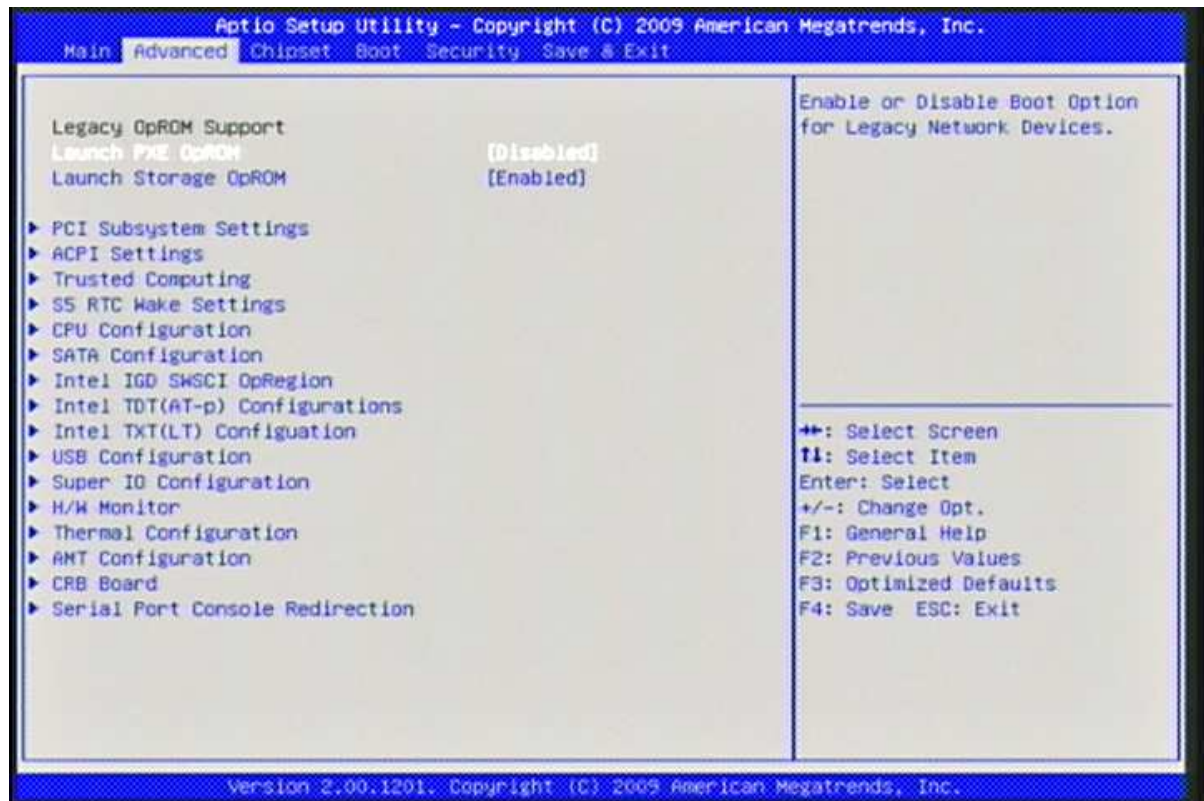
The time format is <Hour> <Minute> <Second>. Use [+] or [-] to configure system Time.

### System Date

The date format is <Day>, <Month> <Date> <Year>. Use [+] or [-] to configure system Date.

## 4.3 Advanced

Use this menu to set up the items of special enhanced features.



### Launch PXE OpROM

Enable or Disable Boot Option for Legacy Network Devices.

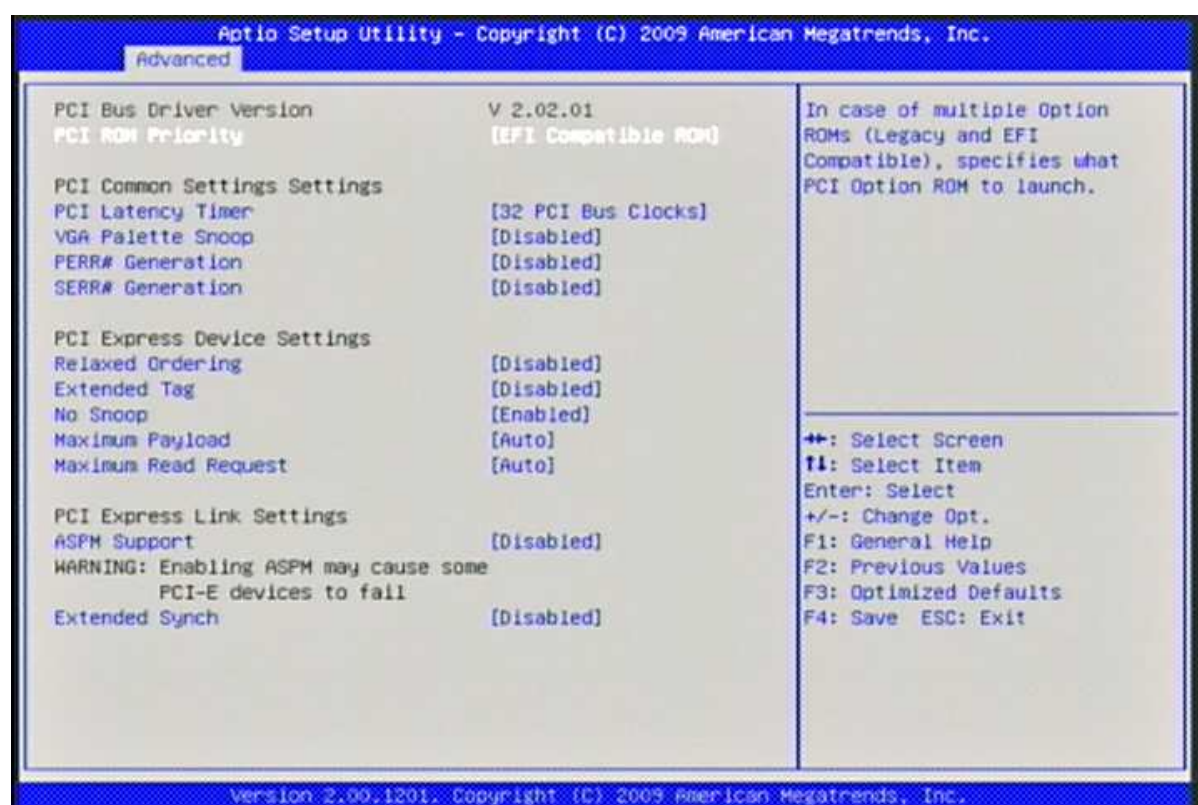
Choices: Disabled, Enabled

### Launch Storage OpROM

Enable or Disable Boot Option for Legacy Mass Storage devices.

Choices: Disabled, Enabled

## PCI Susystems Settings



### PCI ROM Priority

Choices: Legacy ROM, EFI Compatible ROM

### PCI Latency Timer

Choices: 32 PCI, 64 PCI, 96 PCI, 128 PCI, 160 PCI, 192 PCI, 224 PCI, 248 PCI Bus Clocks

### VGA Palette Snoop

Choices: Disabled, Enabled

### PERR# Generation

Choices: Disabled, Enabled

### SERR# Generation

Choices: Disabled, Enabled

### Relaxed Ordering

Choices: Disabled, Enabled

### Extended Tag

Choices: Disabled, Enabled

### No Snoop

Choices: Disabled, Enabled

### Maximum Payload

Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes



### **Maximum Read Request**

Choices: Auto, 128 Bytes, 256 Bytes, 512 Bytes, 1024 Bytes, 2048 Bytes, 4096 Bytes

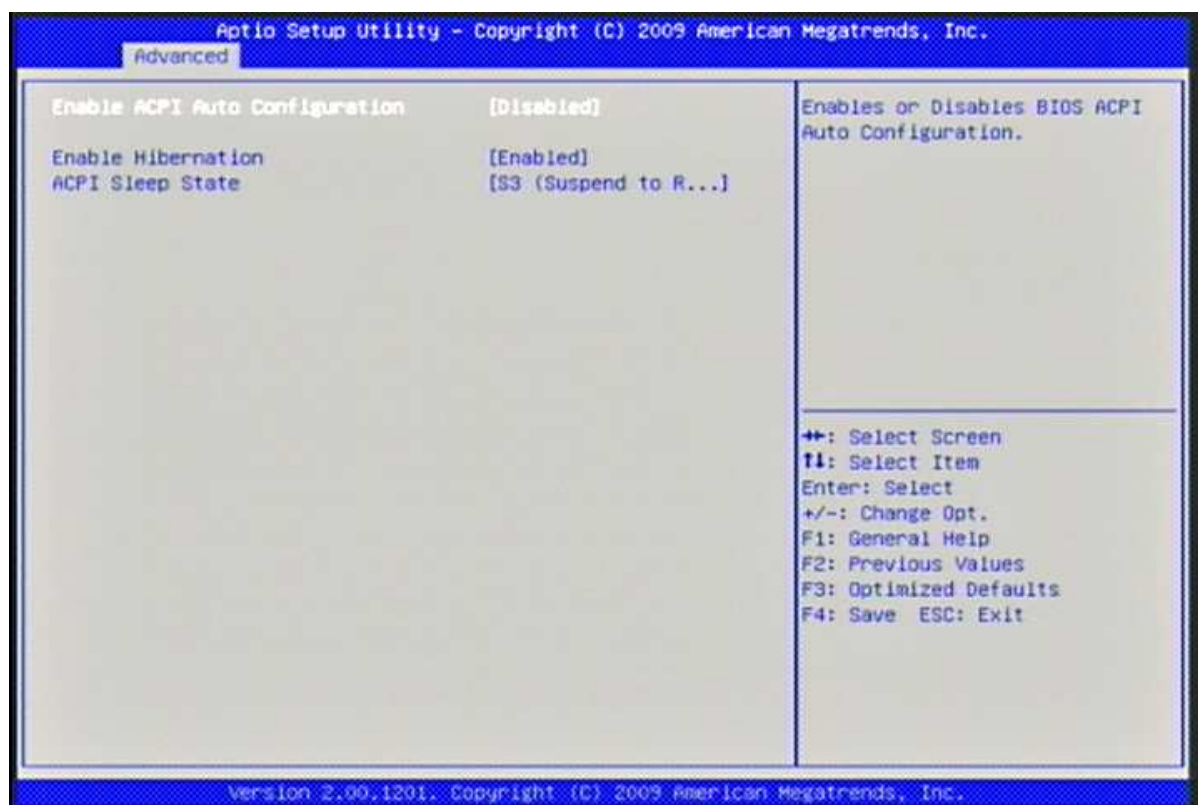
### **ASPM Support**

Choices: Disabled, Auto, Force L0

### **Extended Synch**

Choices: Disabled, Enabled

### **ACPI Settings**



### **Enable ACPI Auto Configuration**

Choices: Enabled, Disabled.

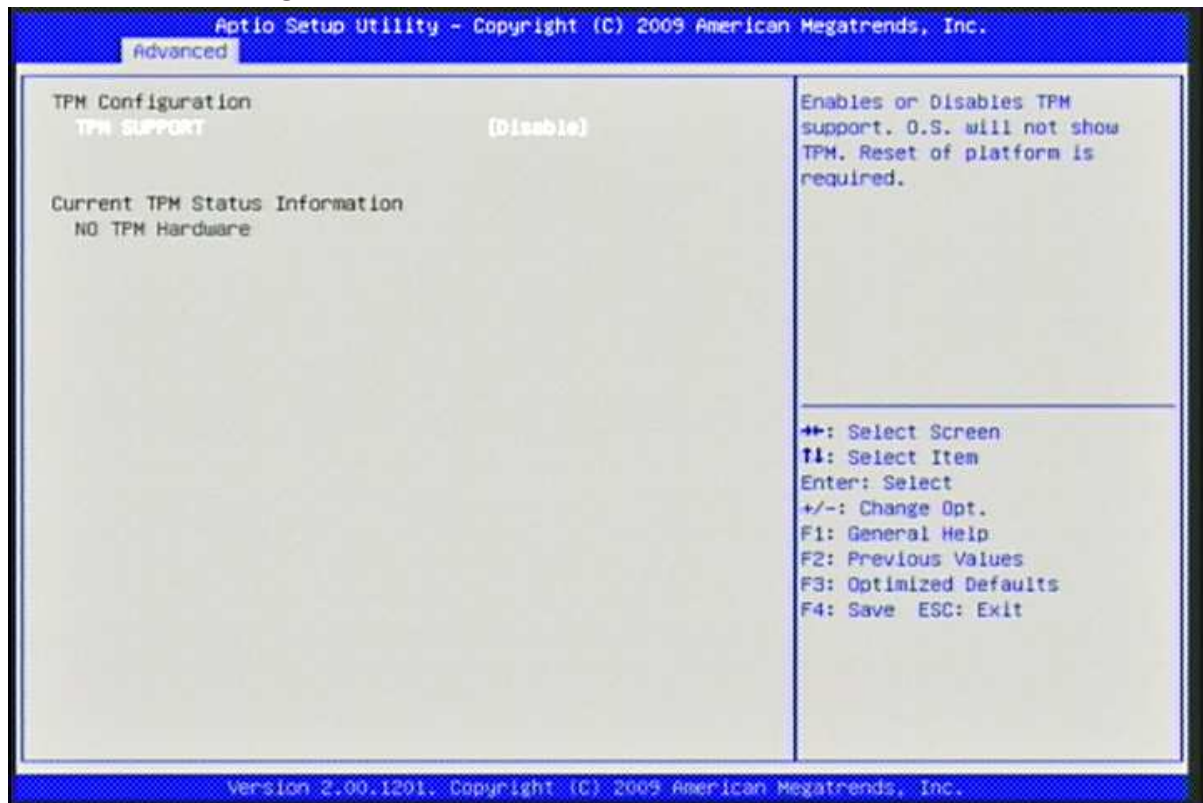
### **Enable Hibernation**

Choices: Enabled, Disabled.

### **ACPI Sleep State**

Choices: Suspend Disabled, S1 (CPU Stop Clock), S3 (Suspend to RAM)

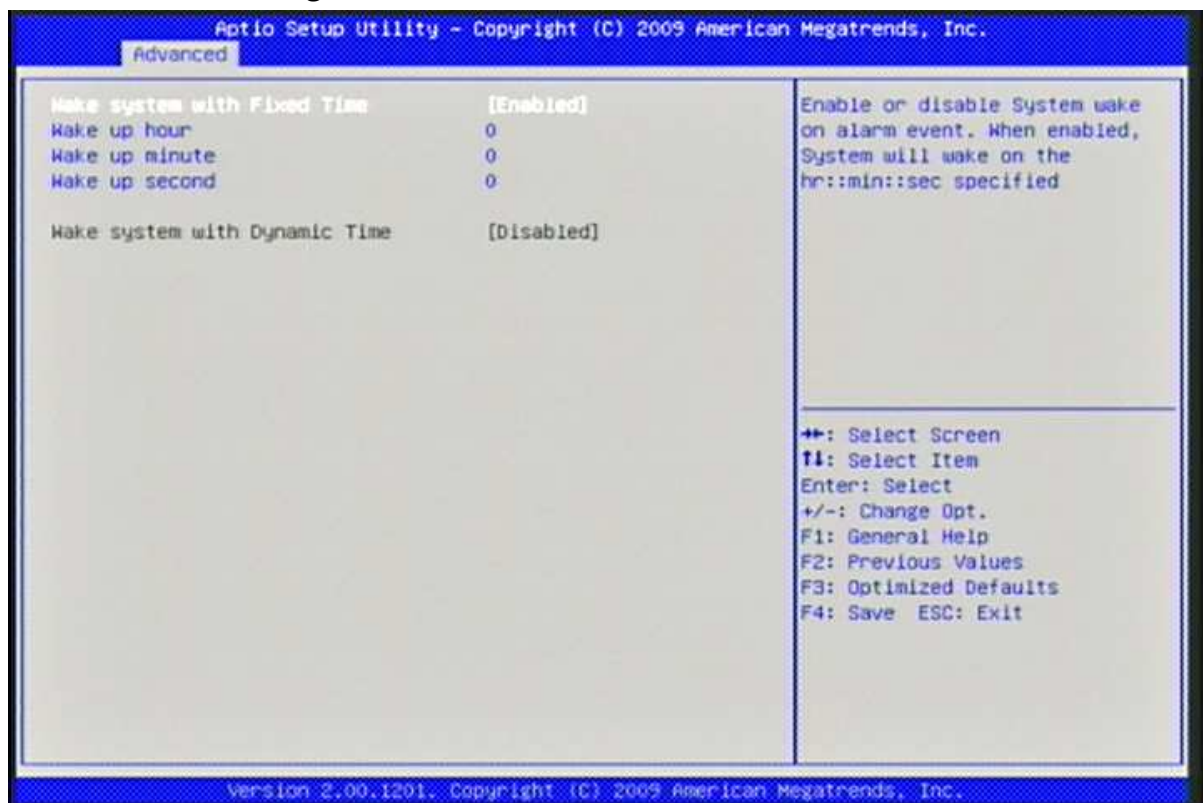
## Trusted Computing



## TPM SUPPORT

Choices: Enabled, Disabled

## S5 RTC Wake Settings



## Wake System with Fixed Time

Choices: Disabled, Enabled

## Wake up hour

Choices: 0-23

## Wake up minute

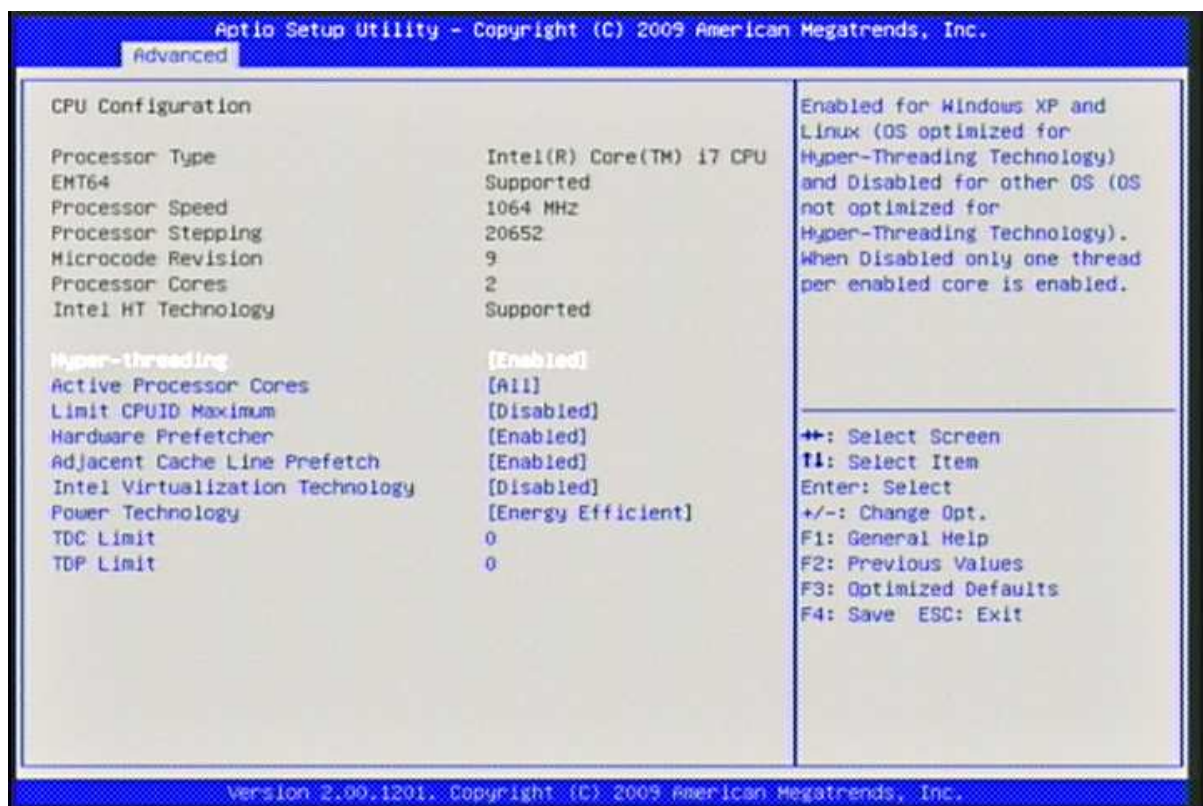
Choices: 0-59

## Wake up second

Choices: 0-59

## CPU Configuration

These items show the advanced specifications of your CPU. Read only.



## Hyper-Threading

Choices: Disabled, Enabled.

## Active Processor Cores

Choices: All, 1, 2

## Limit CPUID Maximum

Disabled for Windows XP

Choices: Disabled, Enabled.

### **Hardware Prefetcher**

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

Choices: Disabled, Enabled.

### **Adjacent Cache Line Prefetch**

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

Choices: Disabled, Enabled.

### **Intel Virtualization Technology**

Choices: Disabled, Enabled.

### **Power Technology**

Choices: Disabled, Energy Efficient, Custom

### **TDC Limit**

Turbo-XE Mode Processor TDC Limit in 1/8 A granularity, 0 means using the factory-configured value.

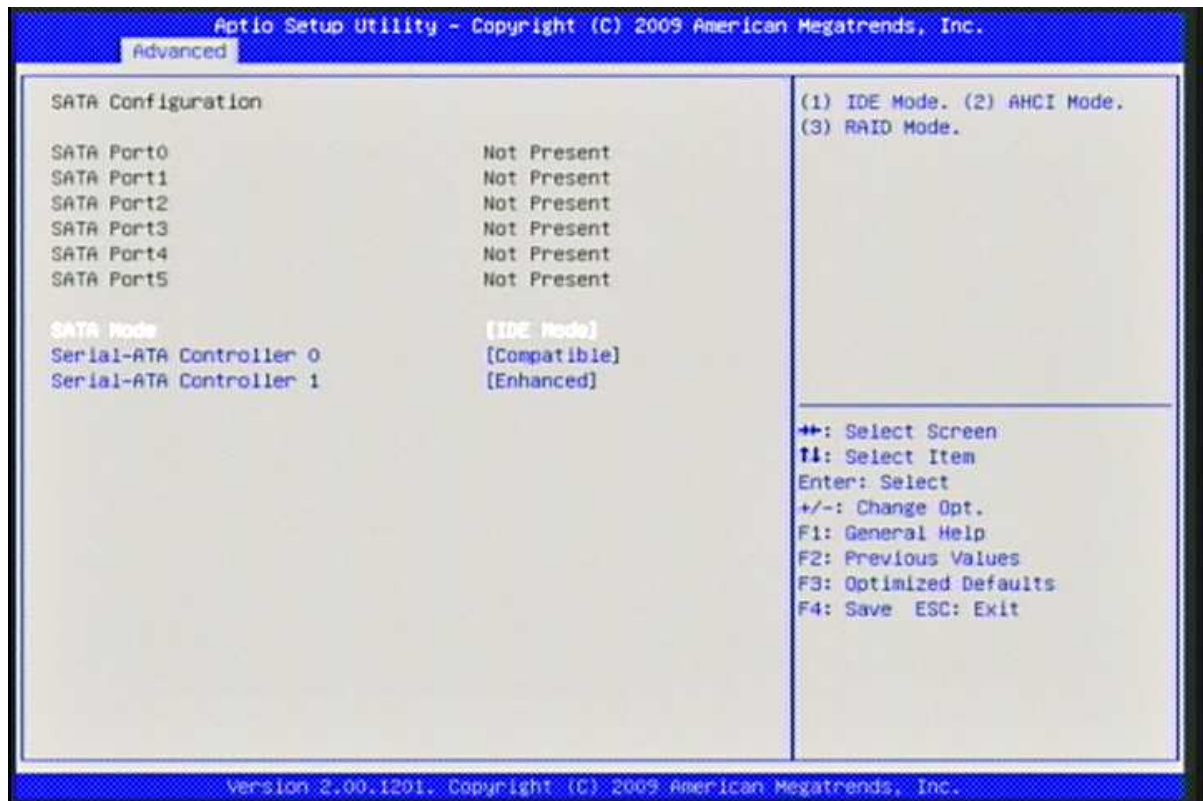
### **TDP Limit**

Turbo-XE Mode Processor TDP Limit in 1/8 W granularity, 0 means using the factory-configured value.



## **SATA Configuration**

The SATA Configuration the SATA devices, such as hard disk drive or CD-ROM drive.



## **SATA Mode**

This setting specifies the function of the on-chip SATA controller.

Choices: Disabled, IDE Mode, RAID Mode, AHCI Mode.

## **Serial ATA Controller 0**

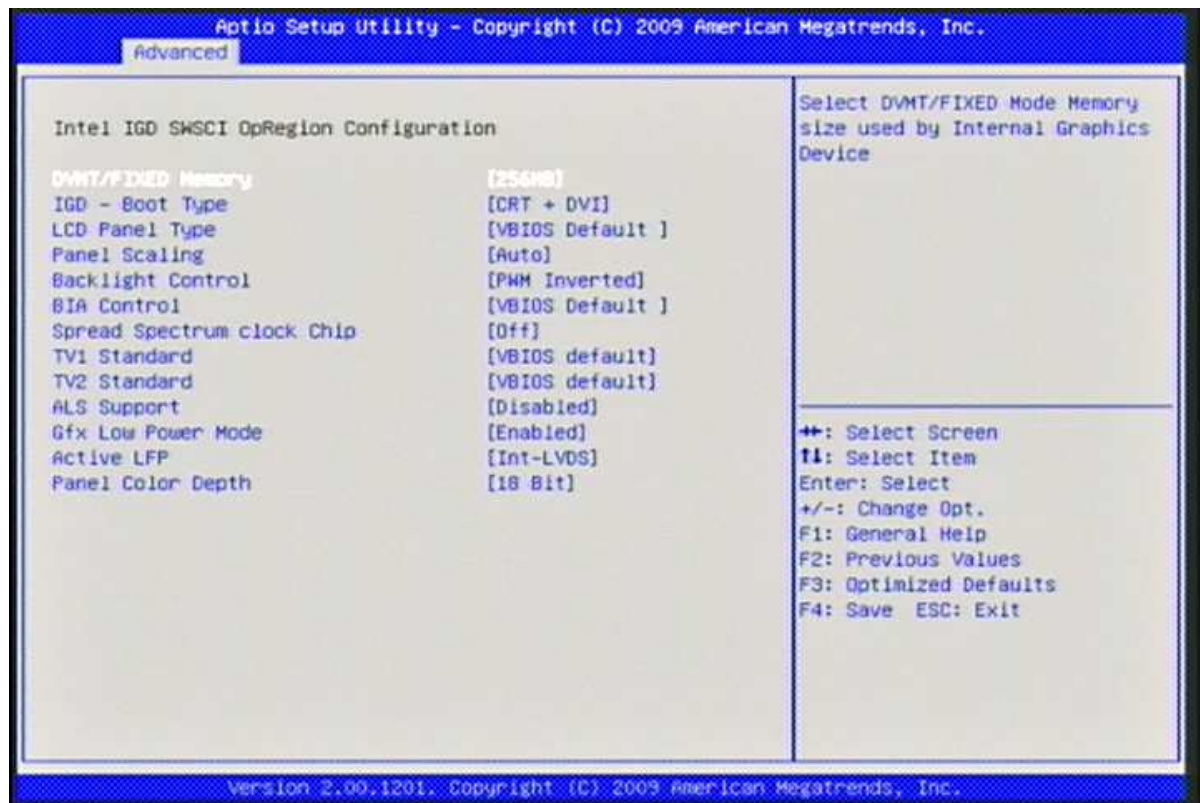
Choices: Disabled, Compatible, Enabled.

## **Serial ATA Controller 1**

Choices: Disabled, Compatible, Enabled.

## **Intel IGD SWSCI OpRegion**

These option contains all the Intel® IGD setting for graphic output



### **DVMT/FIXED Memory**

Choices: 128M, 256MB, Maximum

### **IGD - Boot Type**

Select the Video Device which will be activated during POST.

Choices: VBIOS Default, CRT, HDMI, LVDS, CRT+DVI, CRT+HDMI

### **LCD Panel Type**

Choices: VBIOS Default, 800x600 LVDS, 1024x768 LVDS, 1280x1024 LVDS, 1400x1050 LVDS1, 1400x1050 LVDS2, 1600x1200 LVDS, 1280x768 LVDS, 1680x1050 LVDS, 1920x1200 LVDS, 1600x900 LVDS, 1280x800 LVDS, 1280x600 LVDS, 2048x1536 LVDS

### **Panel Scaling**

Choices: Auto, Force Scaling, Off, Maintain Aspect Ratio.

### **Backlight Control**

Choices: PWM Inverted, PWM Normal, GMBus Inverted, GMBus Normal.

### **BIA Control**

Choices: VBIOS Default, Disabled, From Level 1 to Level 5.

### **Spread Spectrum Clock Chip**

Choices: Off, Hardware, Software

### **ALS Support**

Choices: Disabled, Enabled.

### **Gfx Low Power Mode**

Choices: Disabled, Enabled.

Active LFP

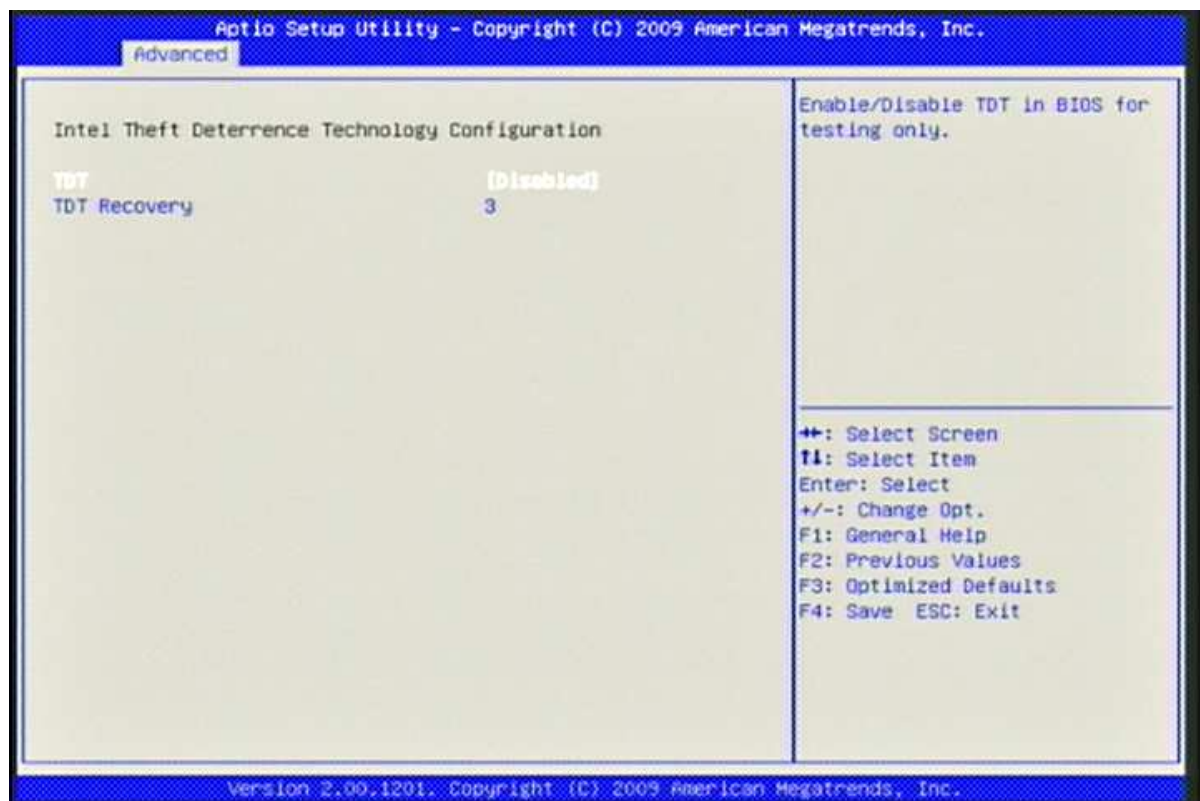
Choices: No LVDS, Int-LVDS, SDVO LVDS, eDP Port-A, eDP Port-D

### **Panel Color Depth**

Choices: 18 Bit, 24 Bit

### **Intel TDT(AT-p) Configurations**

Inter Theft Deterrence Technology Configuration



### **TDT**

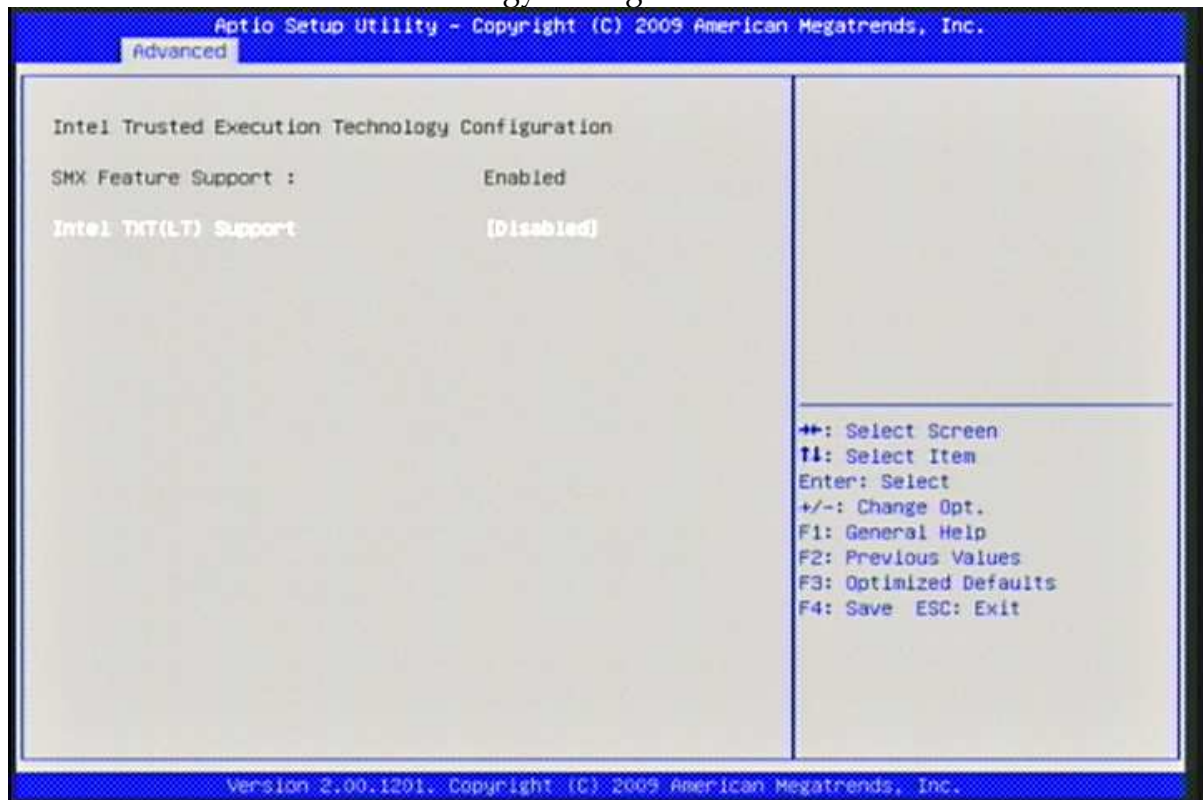
Choices: Disabled, Enabled.

### **TDT Recovery**

Choices: 1-64

## Intel TXT(LT) Configuration.

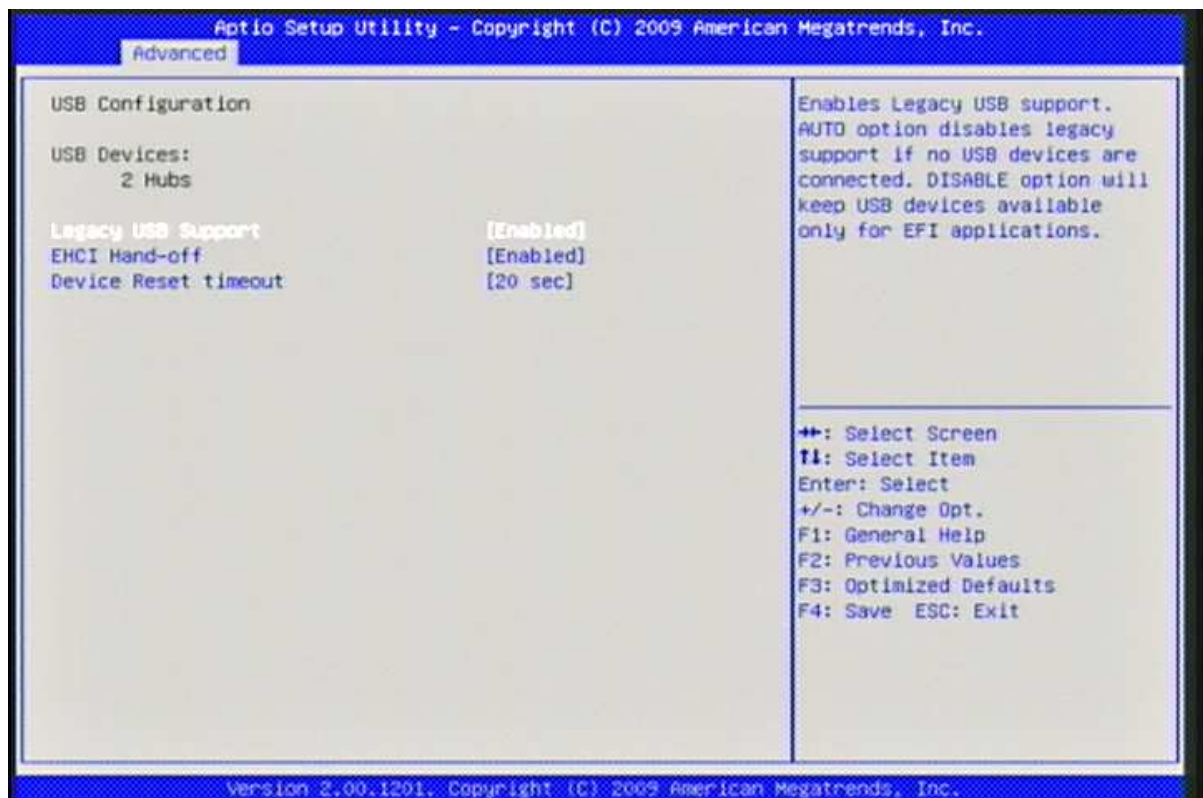
### Intel® Trusted Execution Technology Configuration.



### Intel TXT(LT) Support

Choices: Disabled, Enabled.

## USB Configuration



### Legacy USB Support

Set to [Enabled] if you need to use any USB 1.1/2.0 device in the operating system that does not support or have any USB 1.1/2.0 driver installed, such as DOS and SCO Unix.

Choices: Disabled, Enabled, Auto.

### EHCI Hand-Off

This is a workaround for OSes without EHCI hand-off support. The EHCI ownership change should claim by EHCI driver.

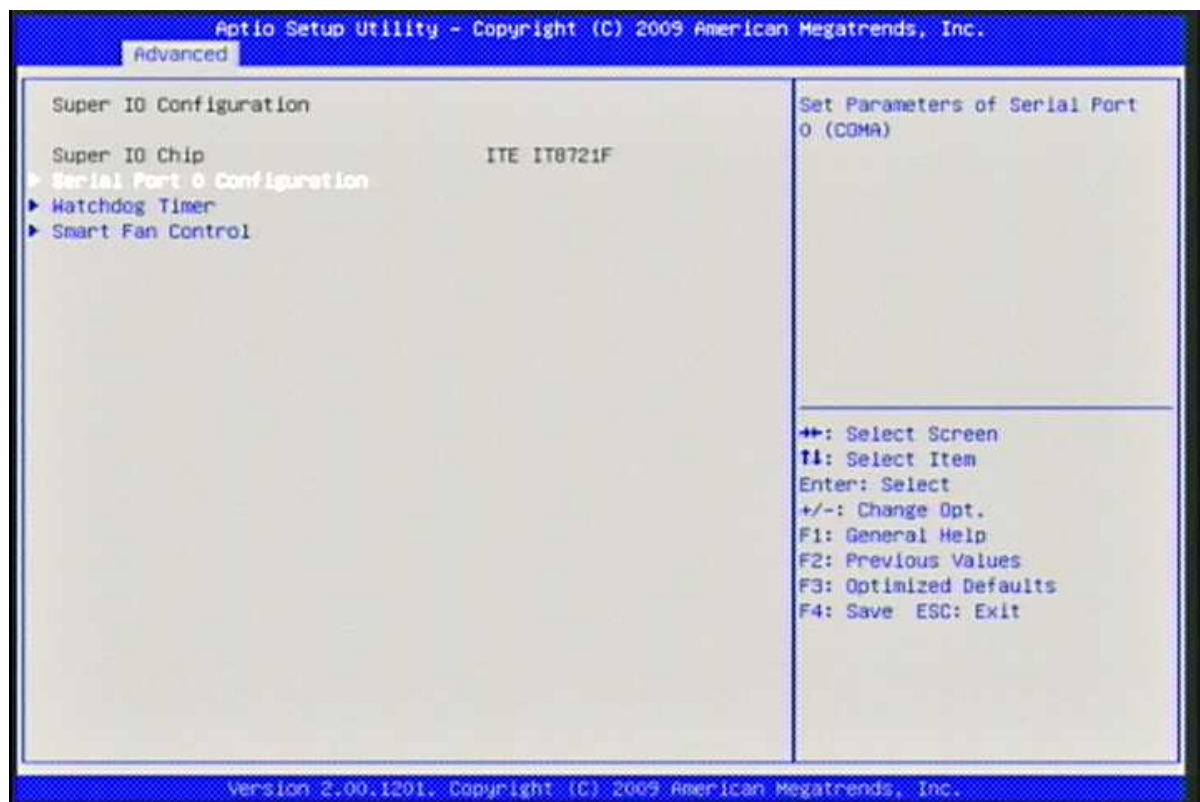
Choices: Disabled, Enabled.

### Device Reset timeout

Choices: 10 sec, 20 sec, 30 sec, 40 sec

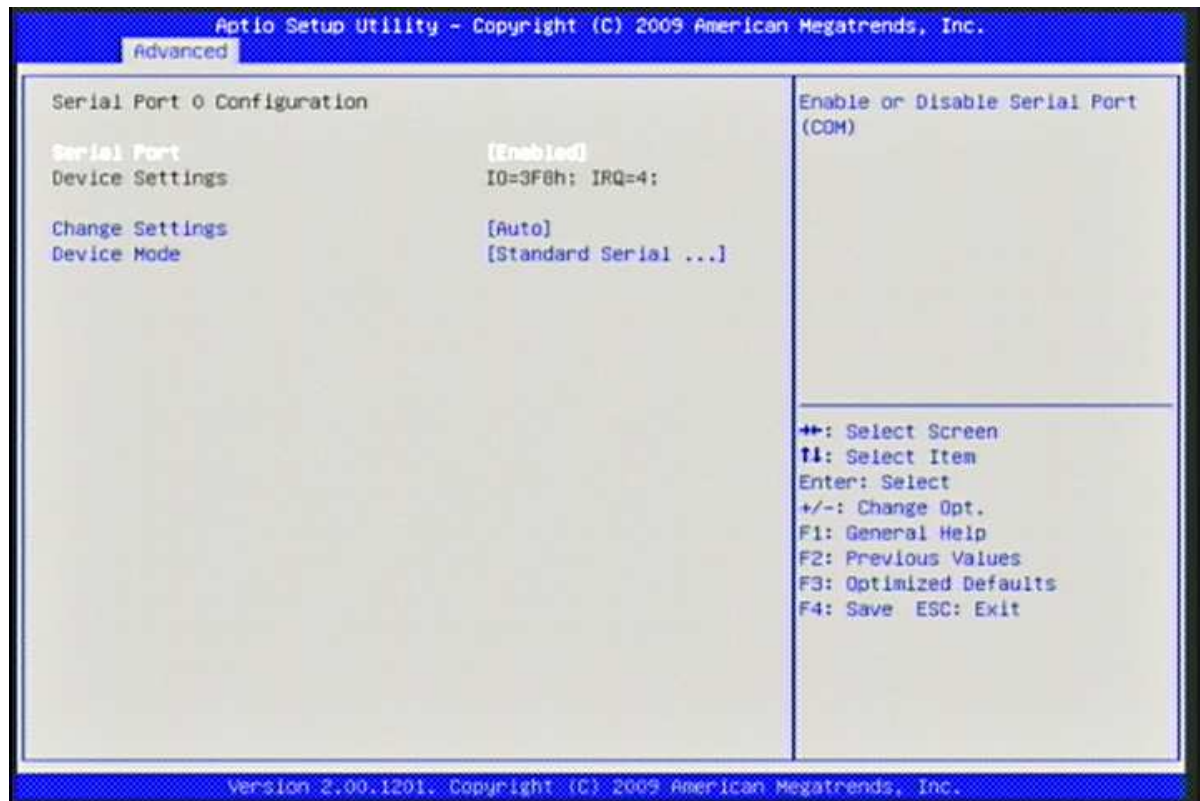
### Super IO Configuration

List all the option that can be set of Super I/O.  
Including Serial Port 0 Configuration, Watchdog Timer, Smart Fan Control





## Serial Port 0 Configuration



### Serial Port

Choices: Disabled, Enabled,

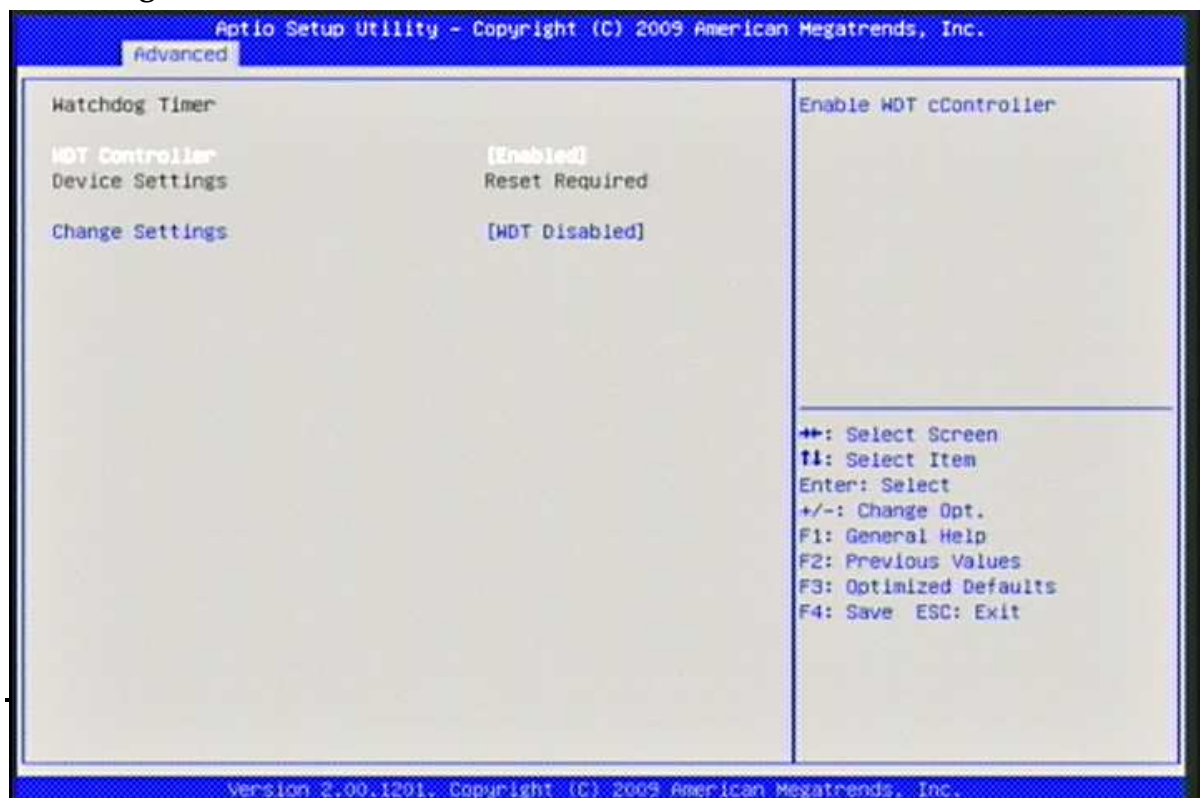
### Change Settings

Choices: Auto. IO=3F8h; IRO=4, IO=3F8h; IRO=3,4,5,6,7,10,11,12, IO=2F8h;  
IRO=3,4,5,6,7,10,11,12, IO=3E8h; IRO=3,4,5,6,7,10,11,12, IO=2F8h;  
IRO=3,4,5,6,7,10,11,12,

### Device Mode

Choices: Standard Serial Port Mode, IrDA 1.0 (HP SIR) mode, ASKIR Mode

### Watchdog Timer



### WDT Controller

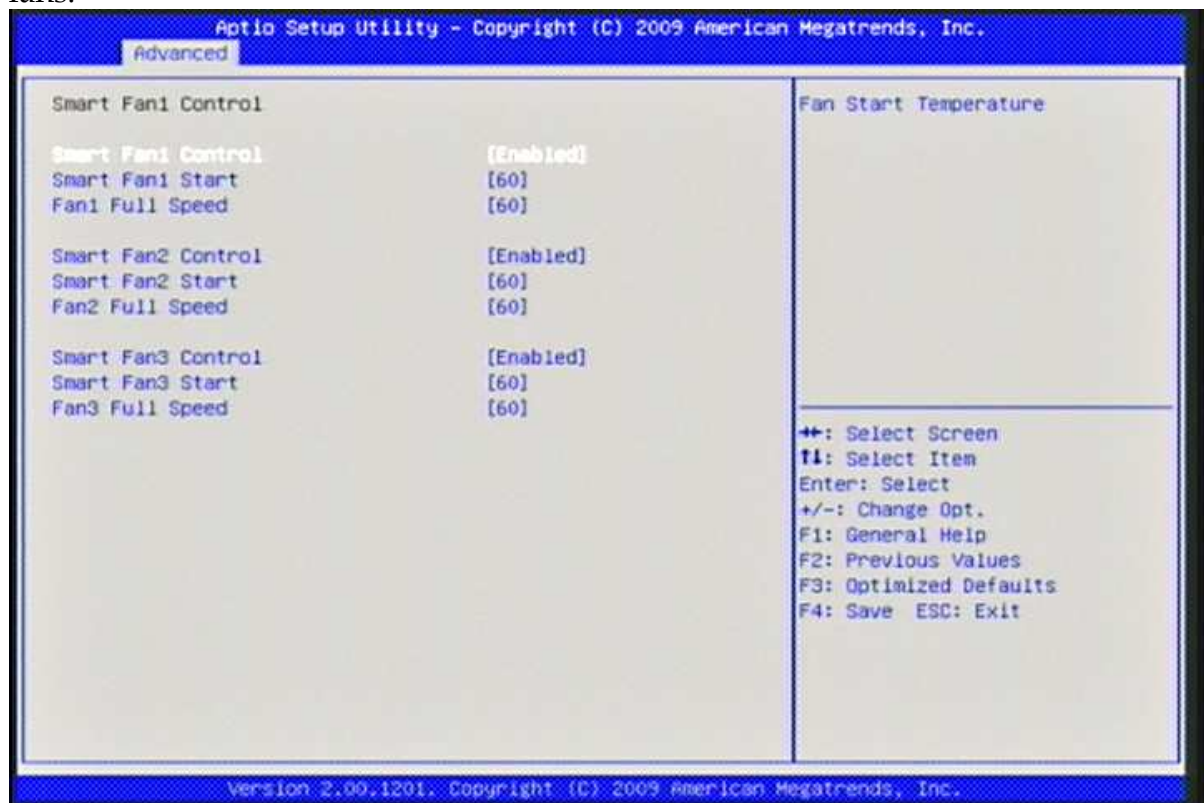
Choices: Disabled, Enabled,

### Change Settings

Choices: WDT Disabled, 10, 20, 30, 40, 50, 60 seconds.

### Smart Fan Control

There options will allow to change the setting of Smart Fan function of CPU, System fans.



### Smart Fan1 Control

Choices: Disabled, Enabled,

### Smart Fan2 Control

Choices: Disabled, Enabled,

### Smart Fan2 Start

Choices: 60, 65, 70, 75

### Fan2 Full Speed

Choices: 60, 65, 70, 75

### Smart Fan3 Control

Choices: Disabled, Enabled,

### Smart Fan3 Start

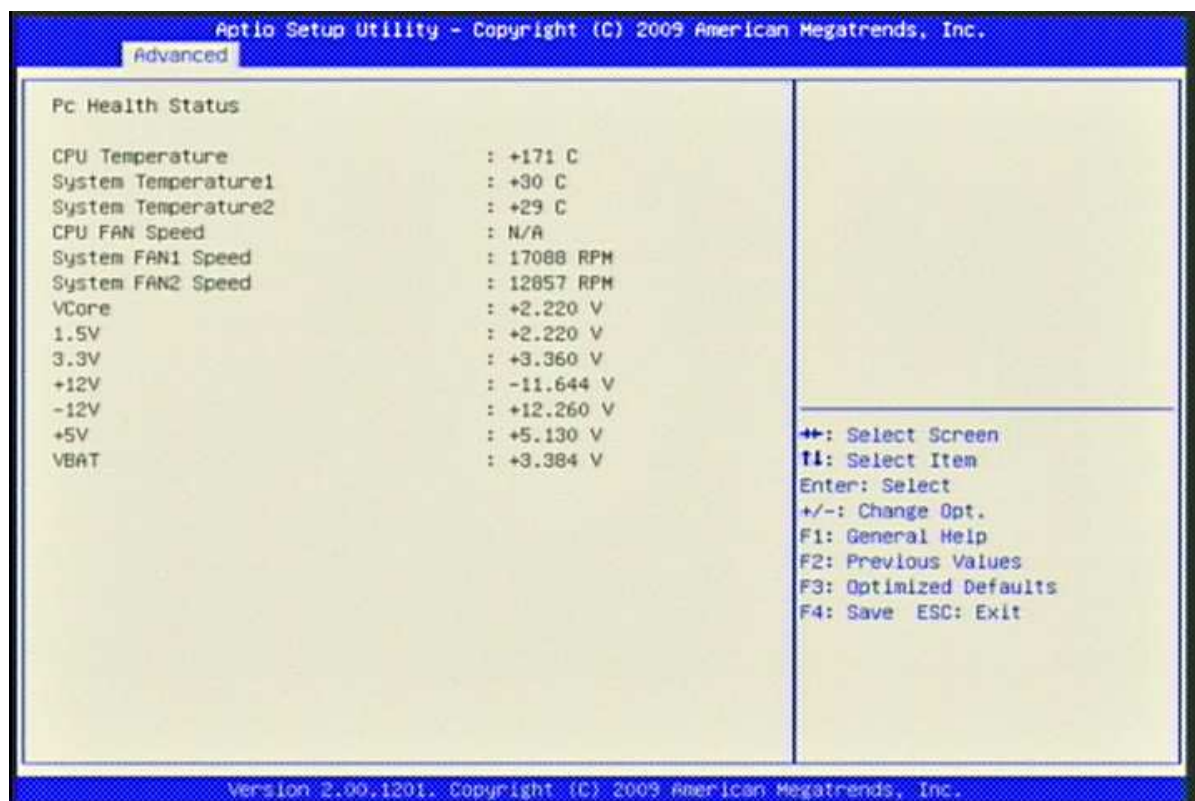
Choices: 60, 65, 70, 75

### Fan3 Full Speed

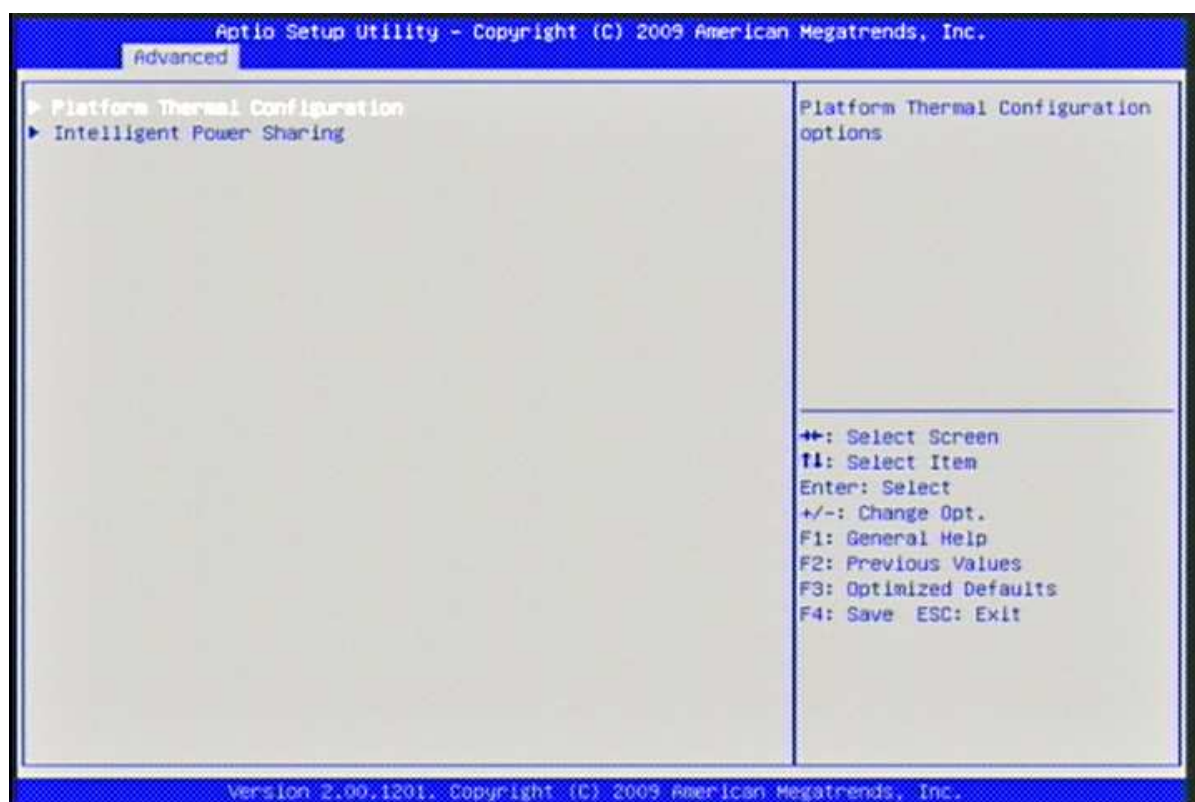
Choices: 60, 65, 70, 75

## Hardware Health Configuration

Configuration / Monitor the Hardware Health. Read only.

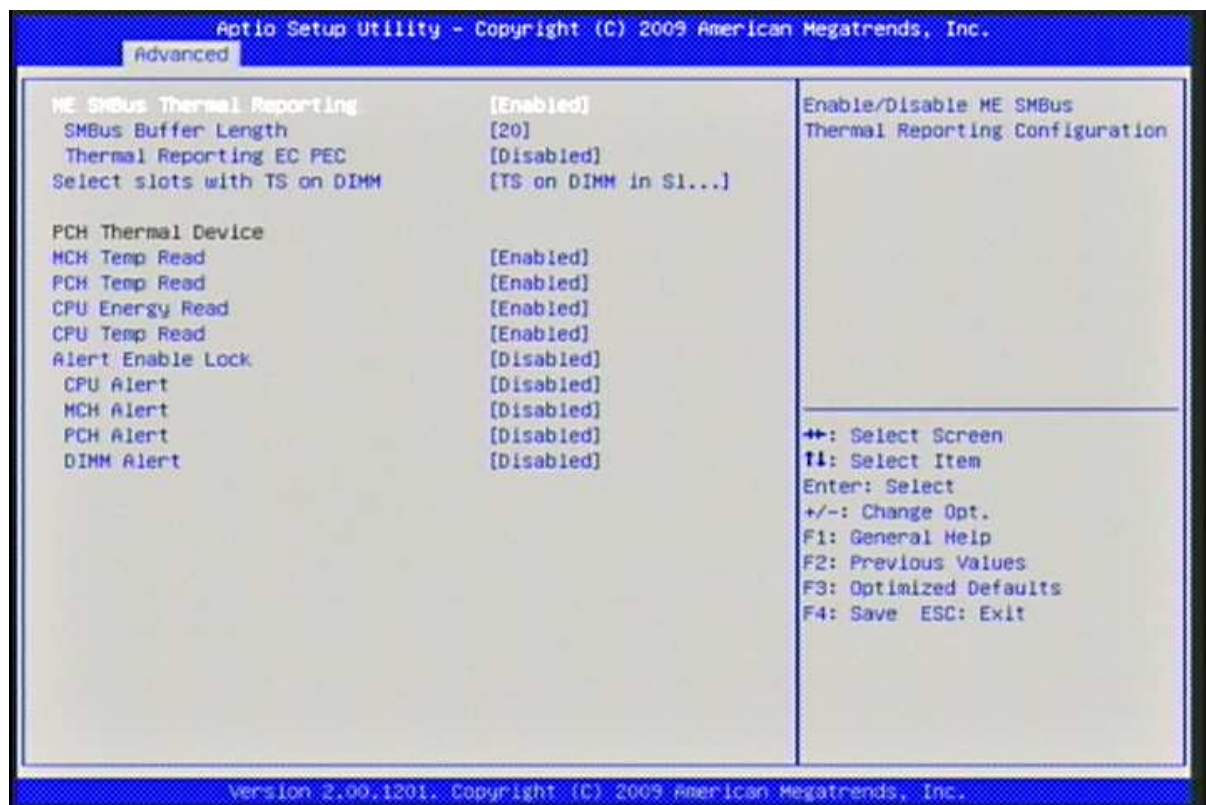


## Thermal Configuration





## Platform Thermal Configuration



### ME SMBus Thermal Reporting

Choices: Disabled, Enabled,

### SMBus Buffer Length

Choices: 1,2,5,9,10,14,20

### Thermal Reporting EC PEC

Choices: Disabled, Enabled,

### Select Slots with TS on DIMM

Choices: NO TS on DIMM. TS on DIMM in Slot SODIMM0, TS on DIMM in Slot SODIMM1, TS on DIMM in Slot SODIMM0 and SODIMM1

### MCH Temp Read

Choices: Disabled, Enabled,

### PCH Temp Read

Choices: Disabled, Enabled,

### CPU Energy Read

Choices: Disabled, Enabled,

### Alert Enable Lock

Choices: Disabled, Enabled,

### CPU Alert

Choices: Disabled, Enabled,

### MCH Alert

Choices: Disabled, Enabled,

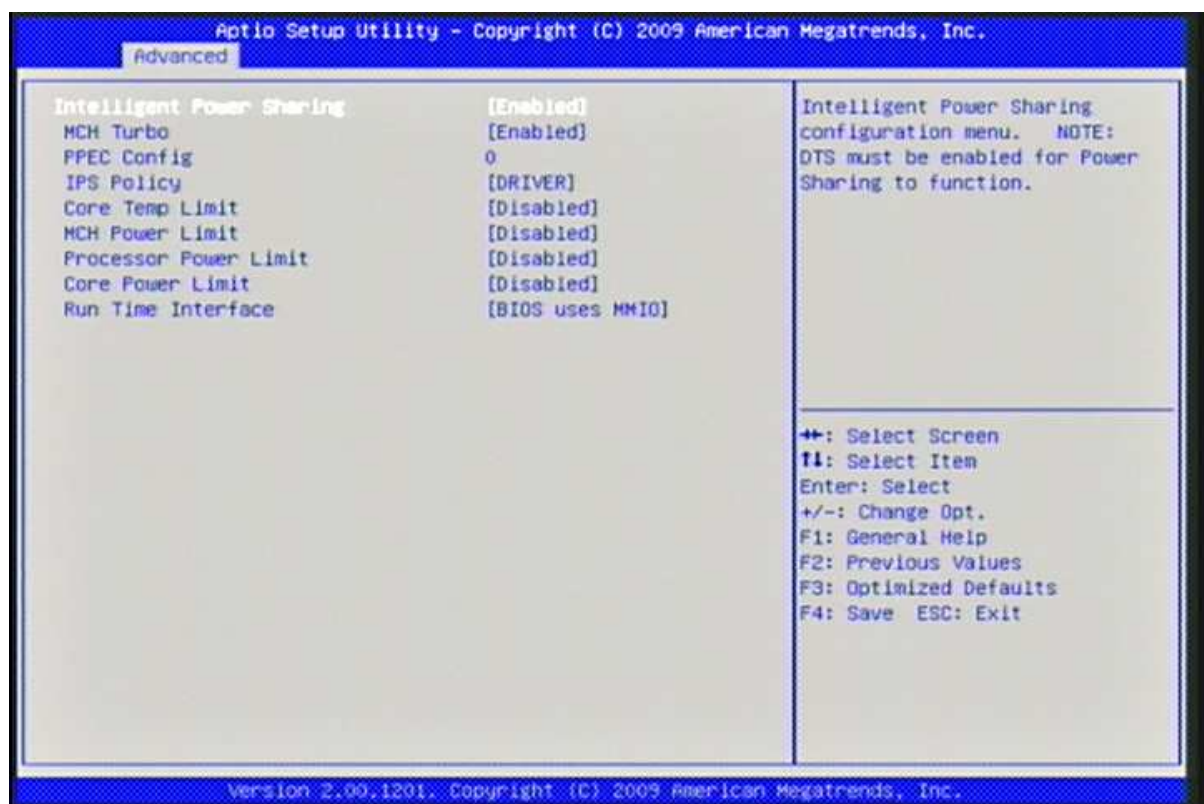
### PCH Alert

Choices: Disabled, Enabled,

### DIMM Alert

Choices: Disabled, Enabled,

### Intelligent Power Sharing



### Intelligent Power Sharing

Choices: Disabled, Enabled,

### MCH Turbo

Choices: Disabled, Enabled,

### PPEC Config

Processor Power Error Correction

Choices: 1 to 50

### IPS Policy

Choices: DRIVER, PROCESSOR, BALANCED, GRAPHICS

### Core Temp Limit

Choices: Disabled, Enabled,

### MCH Power Limit

Choices: Disabled, Enabled,

### Processor Power Limit

Choices: Disabled, Enabled,

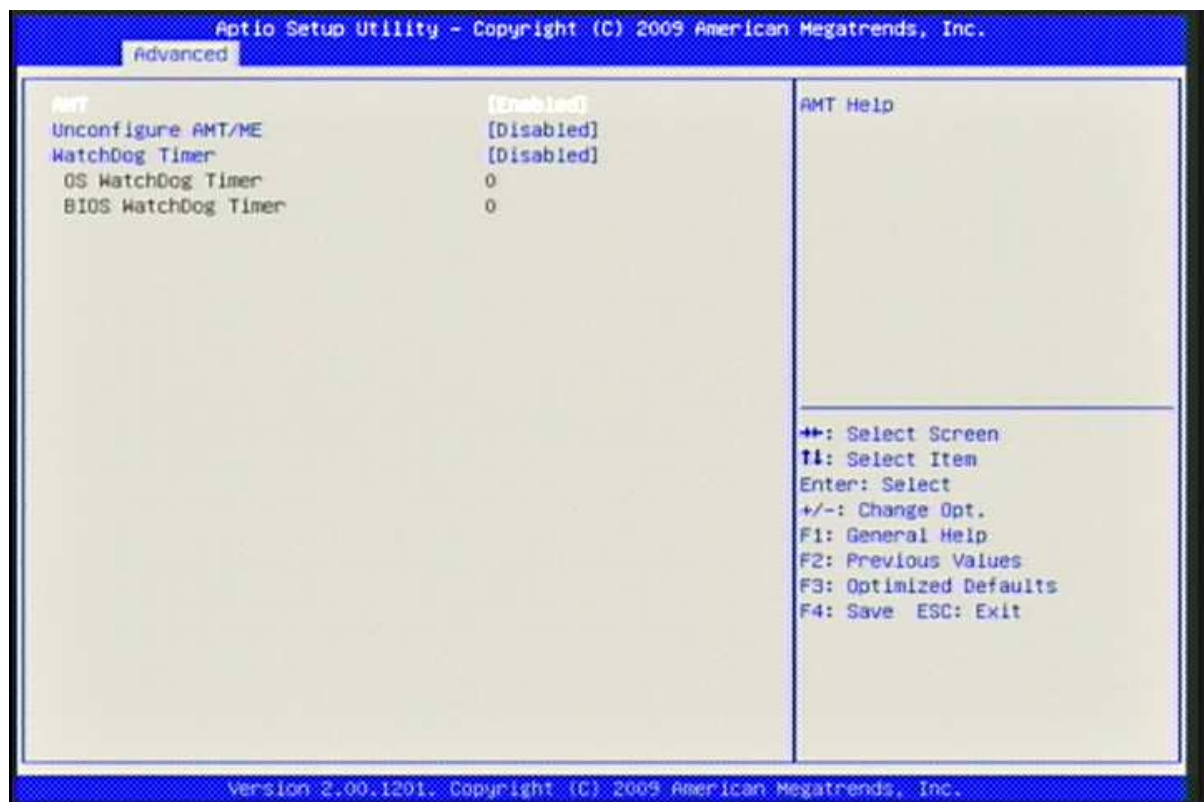
### Core Power Limit

Choices: Disabled, Enabled,

### Run Time Interface

Choices: BIOS with MMIO, EC uses SMBug

### AMT Configuration



### AMT

Choices: Disabled, Enabled,

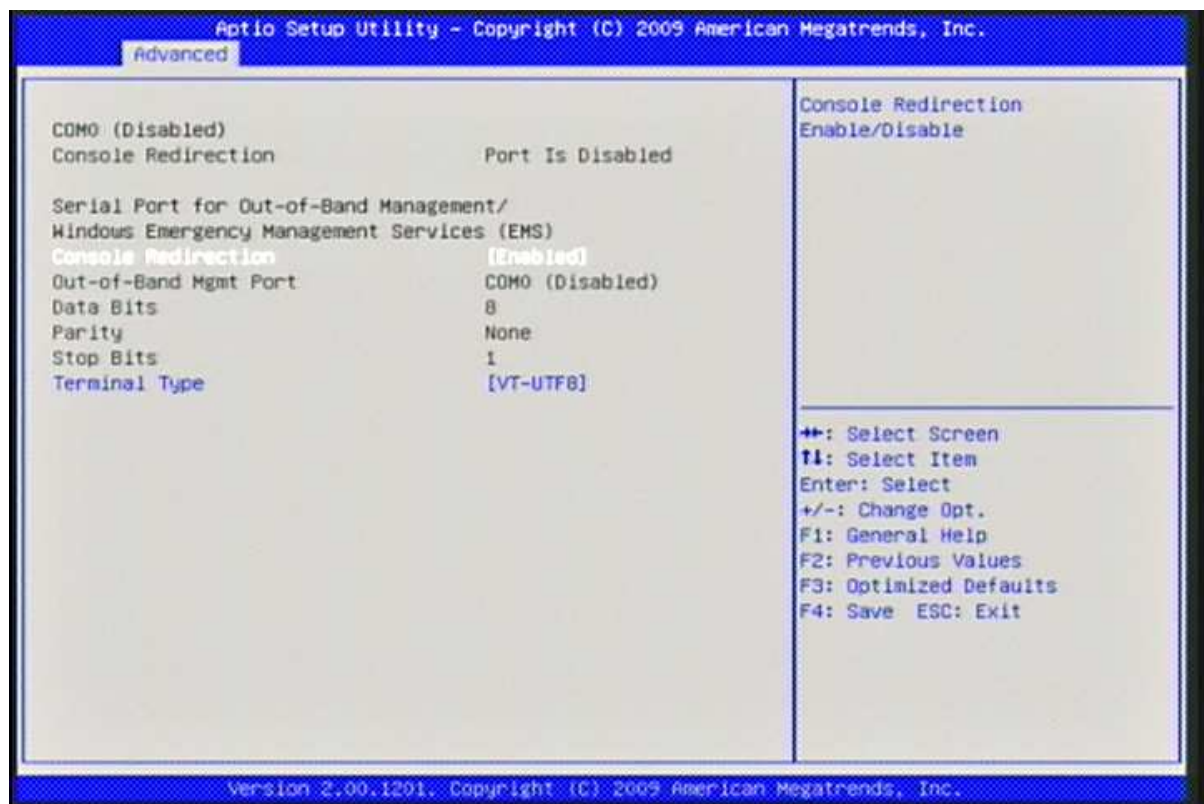
### Unconfigure AMT/ME

Choices: Disabled, Enabled,

### WatchDog Timer

Choices: Disabled, Enabled

### Serial Port Console Redirection



### Console Redirection

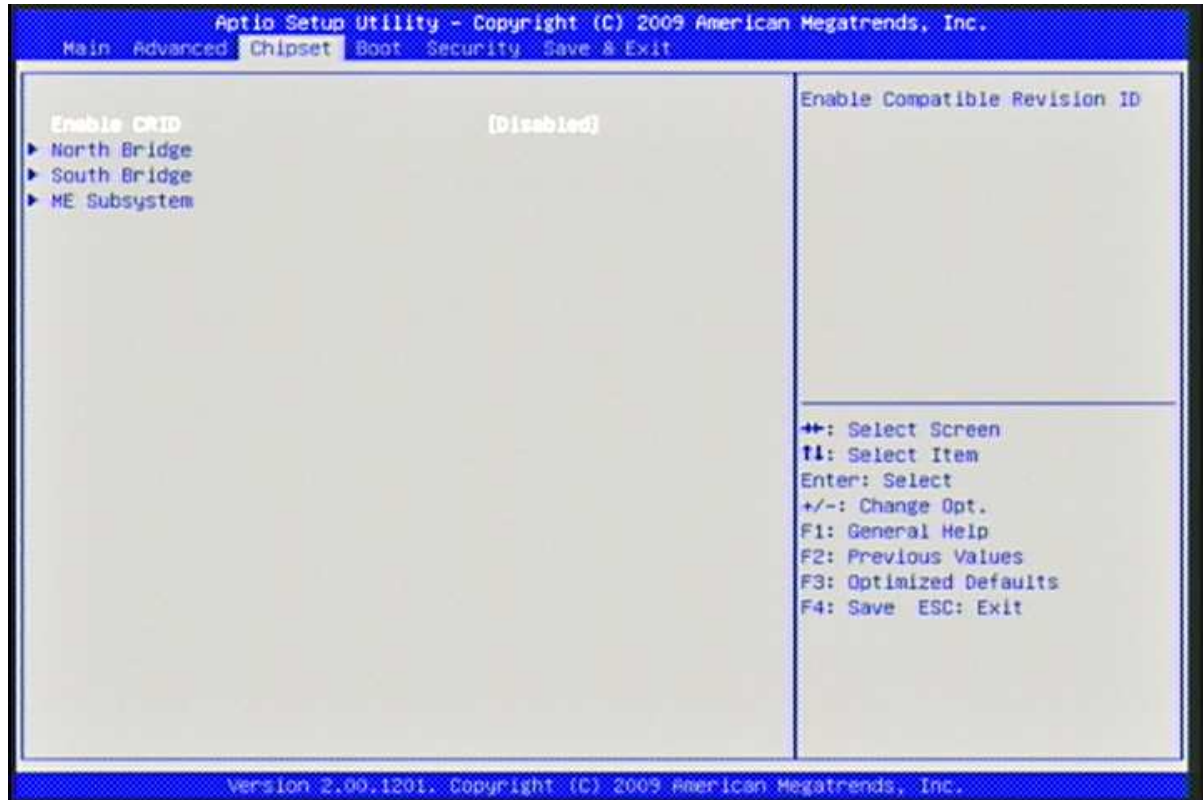
Choices: Disabled, Enabled,

### Terminal Type

Choices: VT100, VT100+, VT-uTF8, ANSI

## 4.4 Chipset

This menu controls the advanced features of the onboard Northbridge and Southbridge.



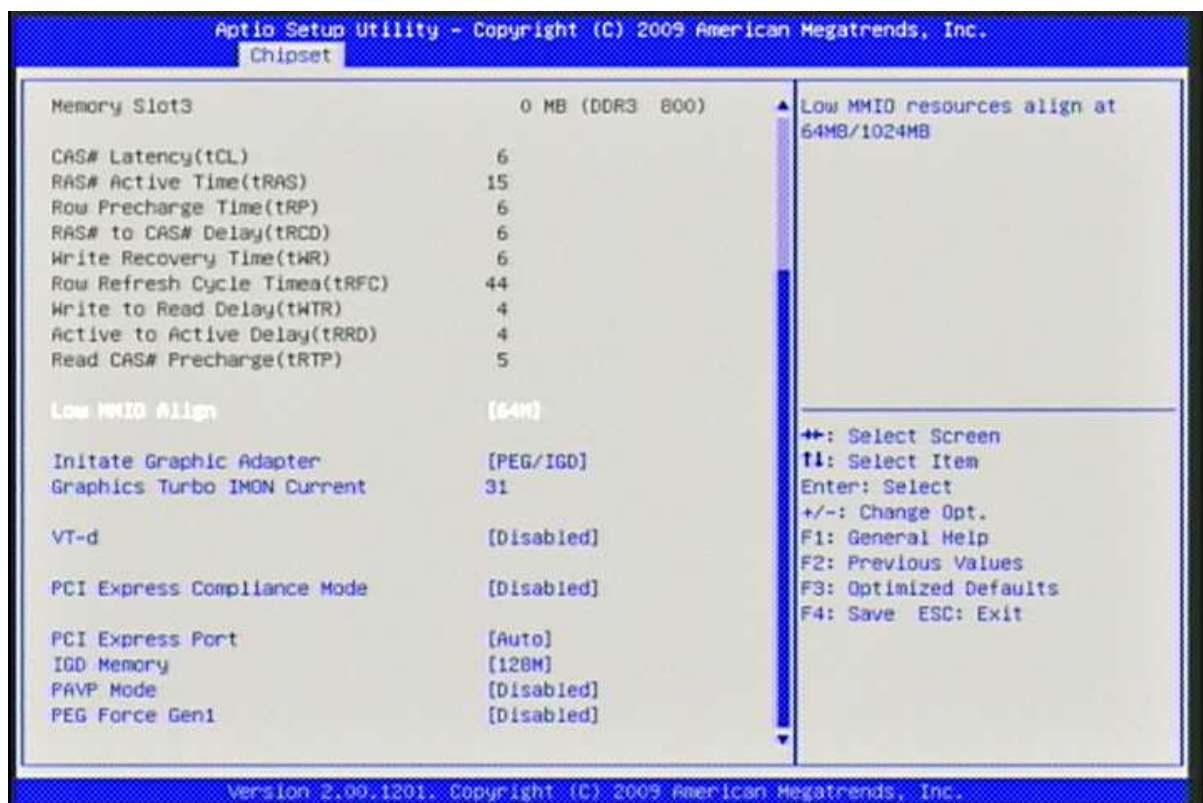
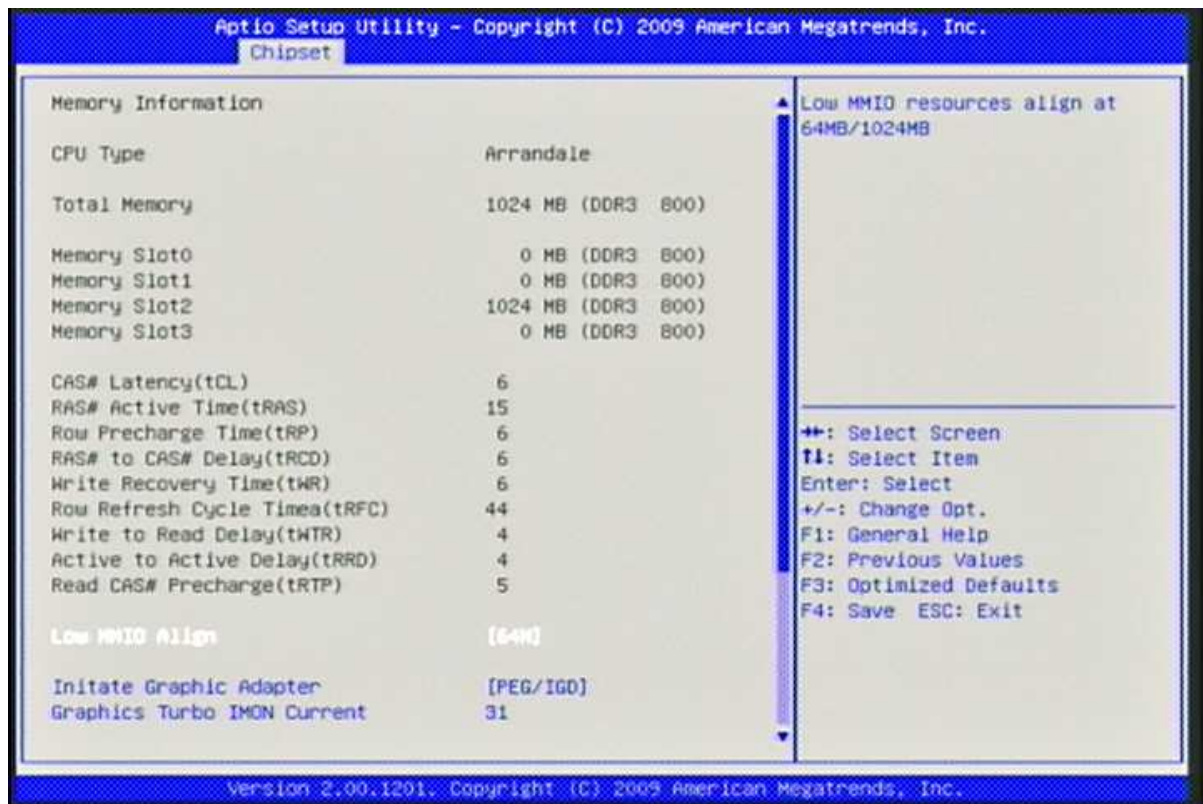
### Enable CRID

Choices: Disabled, Enabled,



## North Bridge Chipset Configuration

CPU & Memory status shows in North Bridge, Read only.



### Low MMIO Align

Choices: 64MB/1024MB

### Initate Graphic Adapter

Select which graphics controller to use as the primary boot device.

Choices: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

### Graphics Turbo IMON Current

Choices: 14-31

### VT-d

Choices: Disabled, Enabled.

### PCI Express Compliance Mode

Choices: Disabled, Enabled,

### PCI Express Port

Choices: Disabled, Enabled, Auto

### IGD Memory

Choices: Disabled, 32M, 64M, 128M

### PAVP Mode

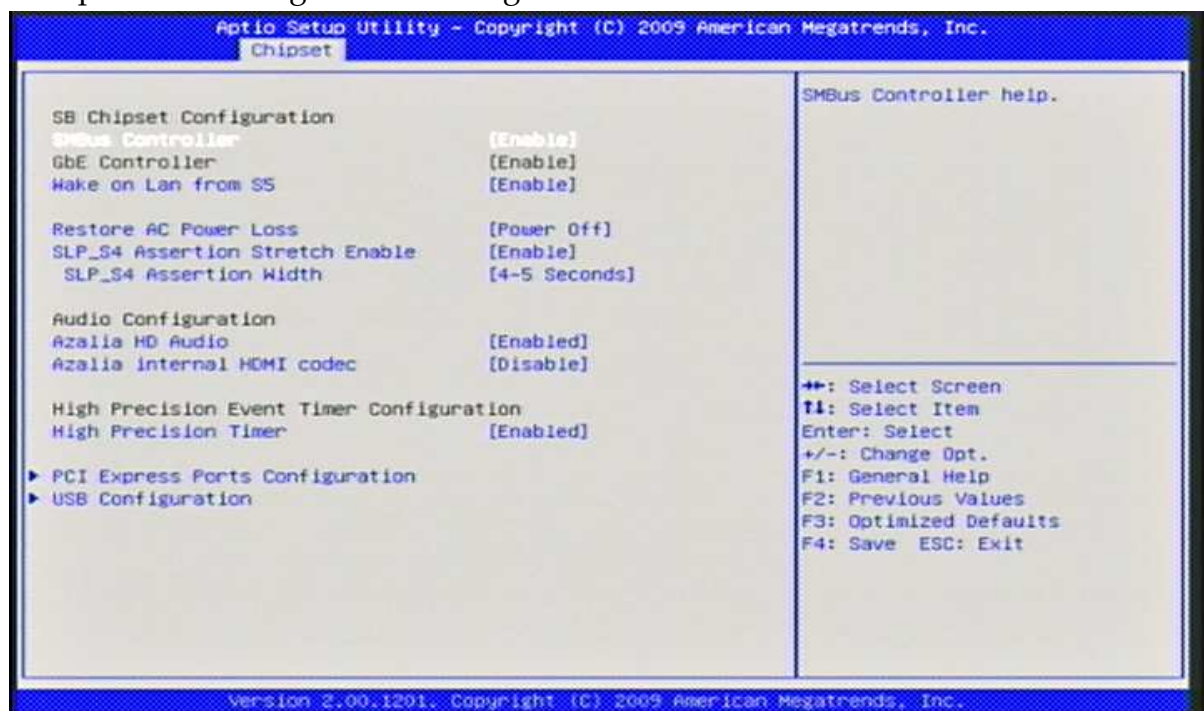
Choices: Disabled, Enabled,

### PEG Force Gen1

Choices: Disabled, Enabled,

### South Bridge Configuration

This provides setting of South Bridge of PCOM-B216VG-VI



### **SMBus Controller**

Choices: Disabled, Enabled,

### **Wake on Lan from S5**

Choices: Disabled, Enabled,

### **Restore AC Power Loss**

Choices: Power Off, Power On, Last State

### **SLP S4 Assertion Stretch Enable**

Choices: Disabled, Enabled,

### **SLP S4 Assertion Width**

Choices: 1-2, 2-3, 3-4, 4-5 seconds

### **Azalia HD Audio**

Choices: Disabled, Enabled,

### **Azalia Internal HDMI Codes**

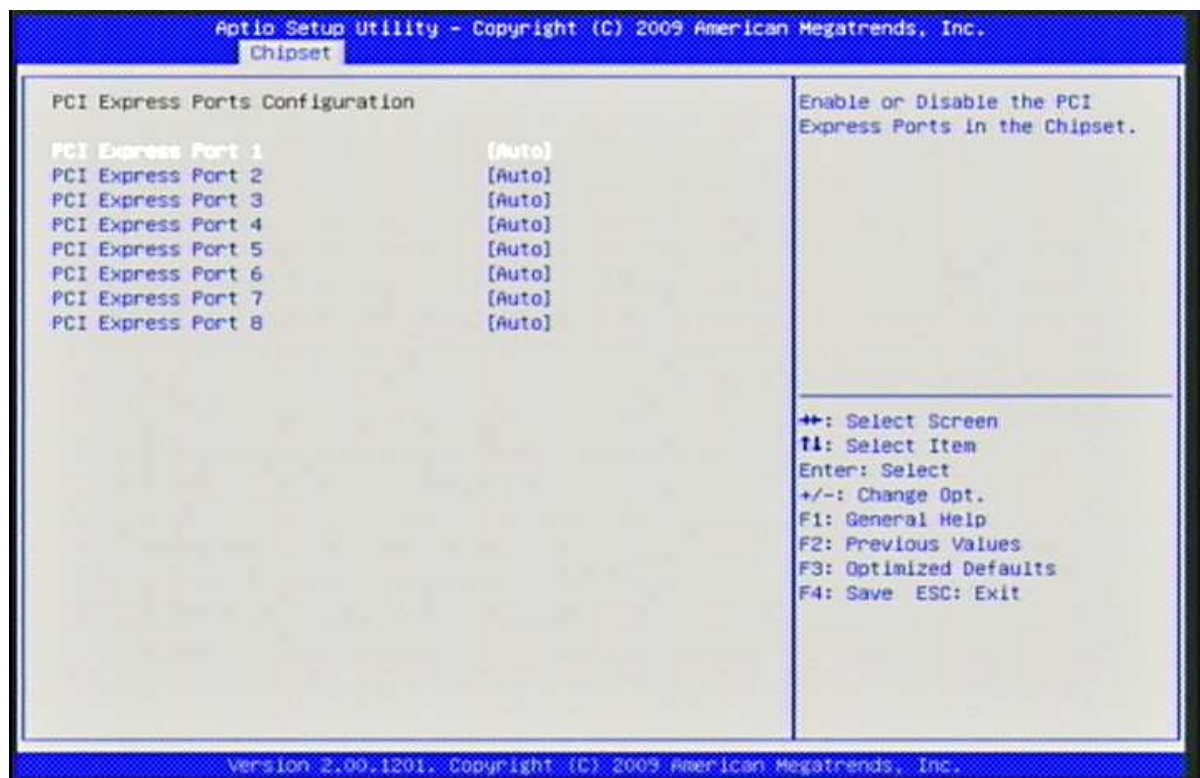
Choices: Disabled, Enabled,

### **High Precision timer**

Choices: Disabled, Enabled,

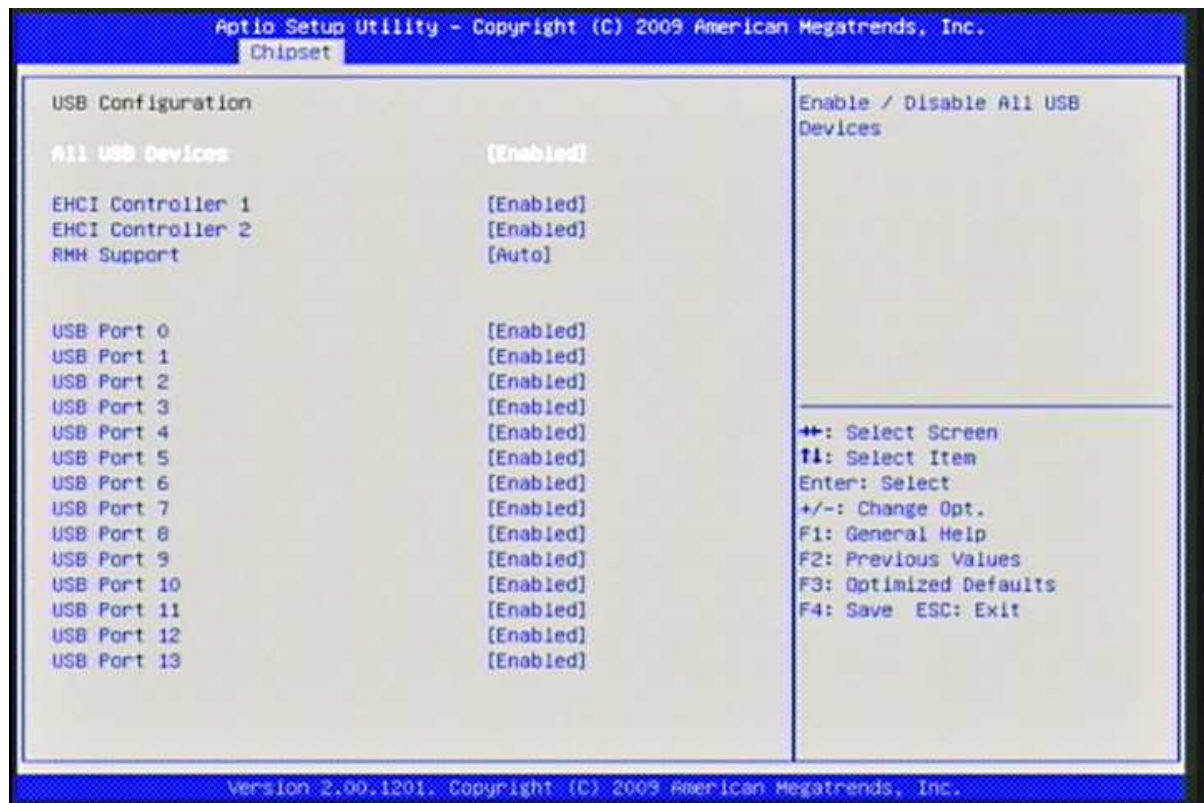
### **PCI Express Ports Configuration**

All PCI Express Ports can be set as choices: Disabled, Enabled, Auto





## USB Configuration



### ALL USB Devices

Choices: Disabled, Enabled

### EHCI Controller 1

Choices: Disabled, Enabled

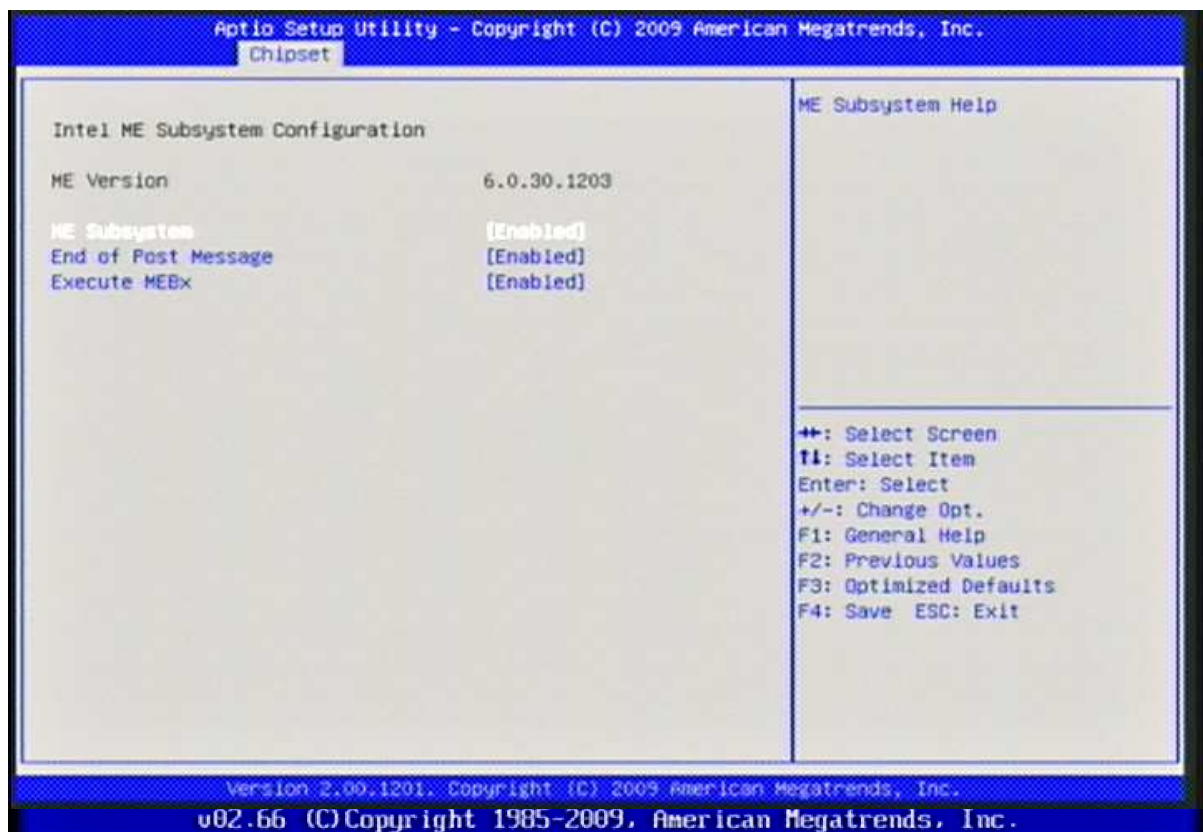
### EHCI Controller 2

Choices: Disabled, Enabled

### RHM Support

Choices: Disabled, Enabled, Auto

## ME Subsystem Configuration



### ME Subsystem Help

Choices: Enabled, Disabled.

### End of Post Message

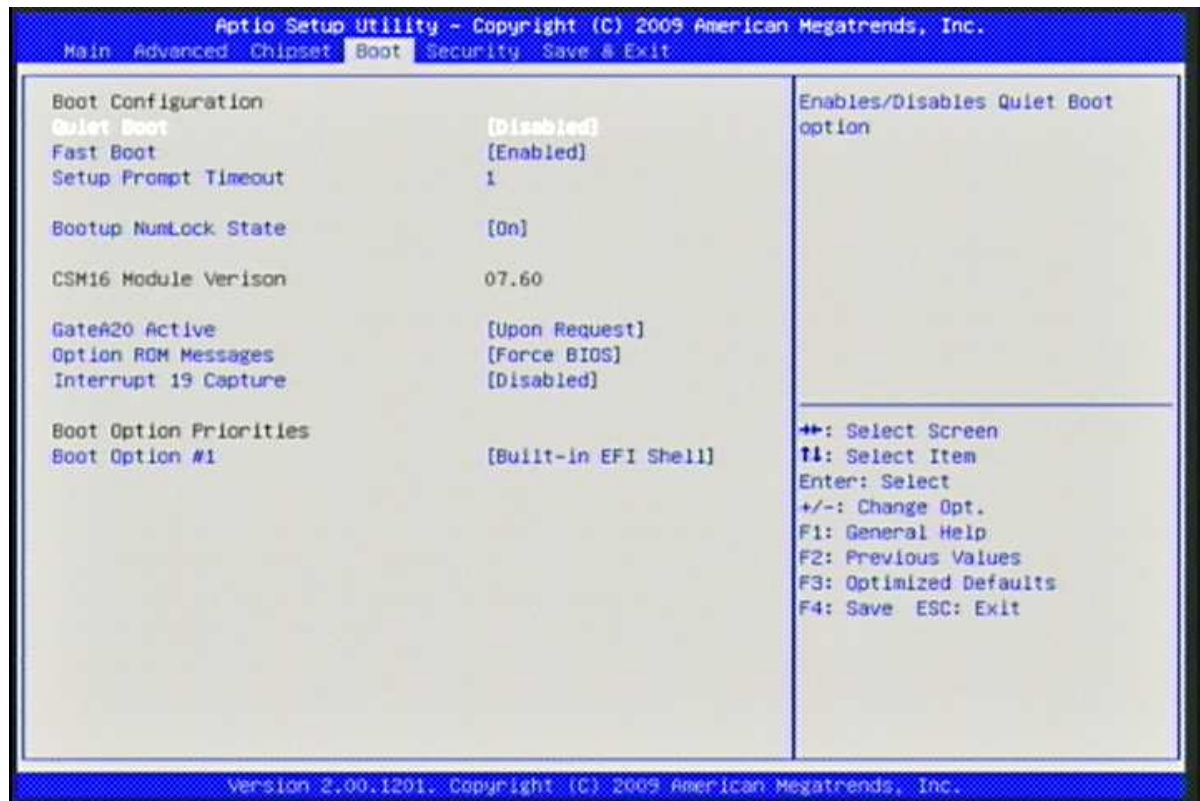
Choices: Enabled, Disabled.

### Execute MEBx

Choices: Enabled, Disabled.

## 4.5 Boot

Use this menu to specify the priority of boot devices.



### Quiet Boot

This BIOS feature determines if the BIOS should hide the normal POST messages with the motherboard or system manufacturer's full-screen logo. When it is enabled, the BIOS will display the full-screen logo during the boot-up sequence, hiding normal POST messages.

When it is disabled, the BIOS will display the normal POST messages, instead of the full-screen logo.

Please note that enabling this BIOS feature often adds 2-3 seconds of delay to the booting sequence. This delay ensures that the logo is displayed for a sufficient amount of time. Therefore, it is recommended that you disable this BIOS feature for a faster boot-up time.

Choices: Disabled, Enabled.

### Fast Boot

Enabling this setting will cause the BIOS power-on self test routine to skip some of its tests during boot up for faster system boot.

Choices: Disabled, Enabled.

### **Bootup Num-Lock State**

This setting is to set the Num Lock status when the system is powered on. Setting to [On] will turn on the Num Lock key when the system is powered on. Setting to [Off] will allow users to use the arrow keys on the numeric keypad.

Choices: On, Off.

### **GateA20 Active**

Choices: Upon Request, Always

### **Option ROM Messages**

This item is used to determine the display mode when an optional ROM is initialized during POST. When set to [Force BIOS], the display mode used by AMI BIOS is used. Select [Keep Current] if you want to use the display mode of optional ROM.

Choices: Force BIOS, Keep Current.

### **Interrupt 19 Capture**

Interrupt 19 is the software interrupt that handles the boot disk function. When enabled, this BIOS feature allows the ROM BIOS of these host adaptors to "capture" Interrupt 19 during the boot process so that drives attached to these adaptors can function as bootable disks. In addition, it allows you to gain access to the host adaptor's ROM setup utility, if one is available.

When disabled, the ROM BIOS of these host adaptors will not be able to "capture" Interrupt 19. Therefore, you will not be able to boot operating systems from any bootable disks attached to these host adaptors. Nor will you be able to gain access to their ROM setup utilities.

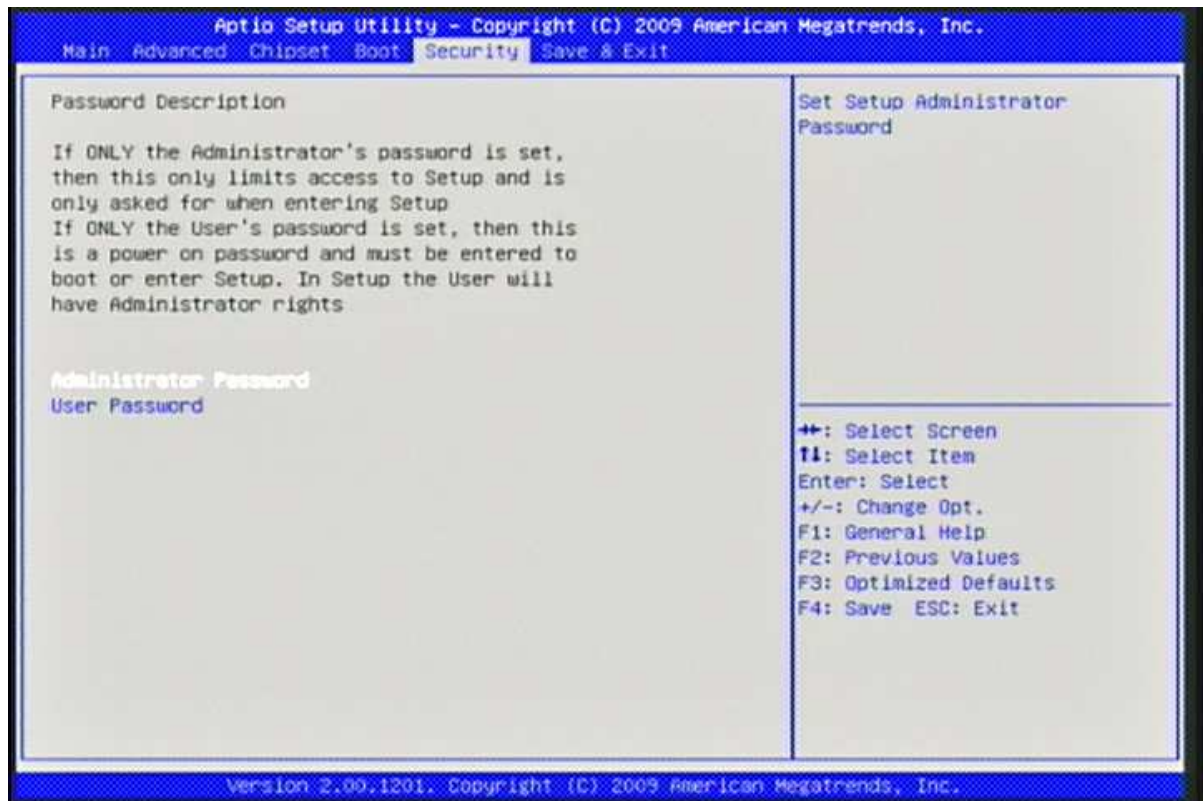
Choices: Disabled, Enabled.

### **Boot Option # 1**

Choices: Built-in EFI Shell

## 4.6 Security

Use this menu to set supervisor and user passwords.



### Administrator Password

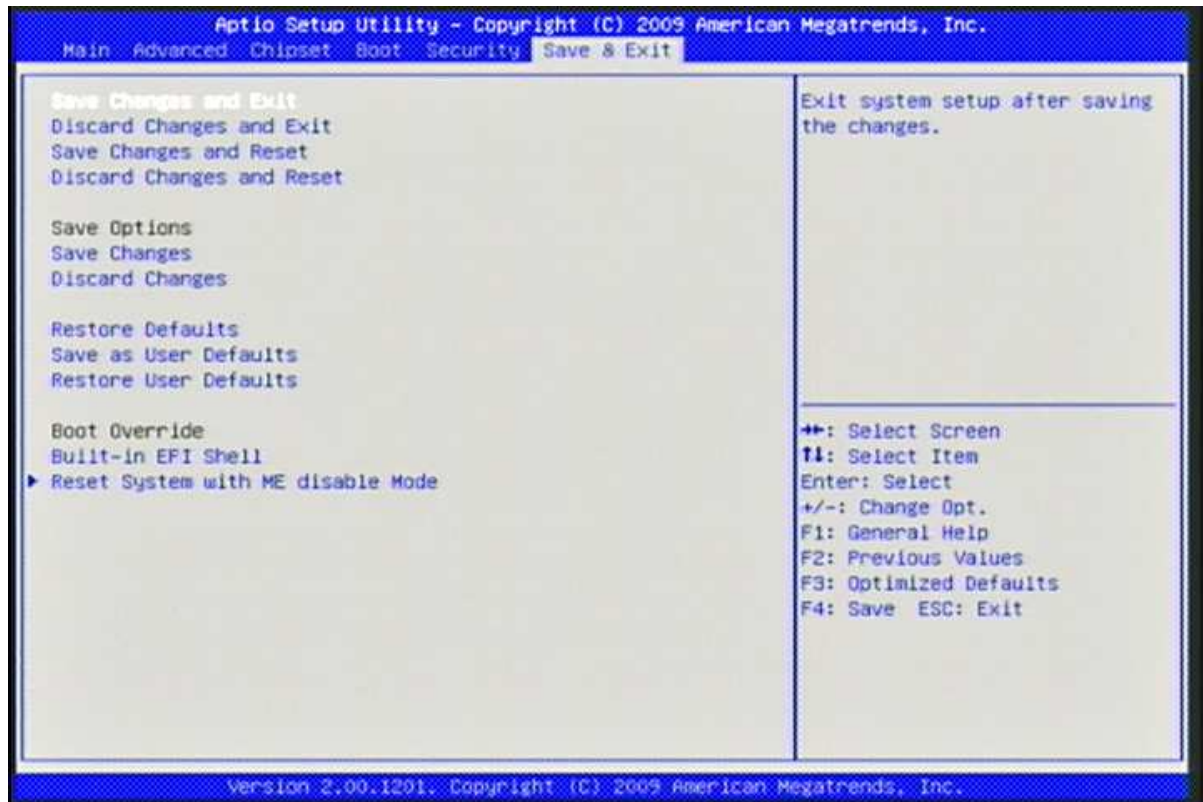
Administrator Password controls access to the BIOS Setup utility. These settings allow you to set or change the supervisor password.

### User Password

User Password controls access to the system at boot. These settings allow you to set or change the user password.

## 4.7 Save & Exit

This menu allows you to load the BIOS default values or factory default settings into the BIOS and exit the BIOS setup utility with or without changes.



### Save Changes and Exit

Exit System Setup and save your changes to CMOS. Pressing <Enter> on this item asks for confirmation: Save changes to CMOS and exit the Setup Utility.

### Discard Changes and Exit

Abandon all changes and exit the Setup Utility.

### Save Changes and Reset

Exit System Setup and save your changes to CMOS then reboot.

### Discard Changes and Reset

Abandon all changes and exit the Setup Utility then reboot

### Save Changes

Save all changes and continue with the Setup Utility.

### Discard Changes

Abandon all changes and continue with the Setup Utility.

### **Restore Defaults**

Use this menu to load the default values set by the SBC manufacturer specifically for optimal performance of the SBC.

### **Save as User Defaults**

Save all changes and considers as User's default.

### **Restore User Default**

Restore the setting according to User's default

### **Built-in EFI Shell**

To enter the Built-in EFI shell for further modification such as upgrade BIOS.

### **Reset System with ME disable Mode**

Reset the system with ME disabled.



## Chapter 5

### Troubleshooting

This chapter provides a few useful tips to quickly get PCOM-B216VG-VI running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting, and OS diagnostics.

#### Hardware Quick Installation

This chapter provides a few useful tips to quickly get PCOM-B216VG-VI Series running with success. As basic hardware installation has been addressed in Chapter 2, this chapter will primarily focus on system integration issues, in terms of BIOS setting.

#### BIOS Setting

To make sure that you have a successful start with PCOM-B216VG-VI, it is recommended, when going with the boot-up sequence, to hit “DEL” key and enter the BIOS setup menu to tune up a stable BIOS configuration so that you can wake up your system far well.

##### Loading the default setting

When prompted with the main setup menu, please scroll down to “**Restore Defaults**”, press “Enter” and “Y” to load in default BIOS setup. This will force your BIOS setting back to the initial factory configuration. It is recommended to do this so you can be sure the system is running with the BIOS setting that Portwell has highly endorsed. As a matter of fact, users can load the default BIOS setting any time when system appears to be unstable in boot up sequence.

##### Improper disable operation

There are too many occasions where users disable a certain device/feature in one application through BIOS setting. These variables may not be set back to the original values when needed. These devices/features will certainly fail to be detected.

When the above conditions happen, it is strongly recommended to check the BIOS settings. Make sure certain items are set as they should be. These include the COM1/COM2 ports, USB ports, external cache, on-board VGA and Ethernet.

It is also very common that users would like to disable a certain device/port to release IRQ resource. A few good examples are

Disable COM1 serial port to release IRQ #4

Disable COM2 serial port to release IRQ #3

Etc...



A quick review of the basic IRQ mapping is given below for your reference.

IRQ#	Description
IRQ #0	System Timer
IRQ #1	Keyboard Event
IRQ #2	Usable IRQ
IRQ #3	COM2
IRQ #4	COM1
IRQ #5	Usable IRQ
IRQ #6	Diskette Event
IRQ #7	Usable IRQ
IRQ #8	Real-Time Clock
IRQ #9	Usable IRQ
IRQ #10	Usable IRQ
IRQ #11	Usable IRQ
IRQ #12	IBM Mouse Event
IRQ #13	Coprocessor Error
IRQ #14	Hard Disk Event
IRQ #15	Usable IRQ

It is then very easy to find out which IRQ resource is ready for additional peripherals. If IRQ resource is not enough, please disable some devices listed above to release further IRQ numbers.

### **System Memory Address Map**

Each On-board device in the system is assigned a set of memory addresses, which also can be identical of the device. The following table lists the system memory address used for your reference.

<b>Memory Area</b>	<b>Size</b>	<b>Device Description</b>
0000-003F	1K	Interrupt Area
0040-004F	0.3K	BIOS Data Area
0050-006F	0.5K	System Data
0070-0E2E	54K	DOS
0E2F-0F6B	5K	Program Area
0F6C-9EFF	574K	[Available]
= Conventional memory ends at 636K =		
9F00-9FBF	3K	Extended BIOS Area
9FC0-9FFF	1K	Unused
A000-AFFF	64K	VGA Graphics
B000-B7FF	32K	Unused
B800-BFFF	32K	VGA Text
C000-CEBF	59K	Video ROM
CEC0-E5BF	92K	Unused
E5C0-EA7F	19K	ROM
EA80-EEFF	18K	Unused
EF00-EFFF	4K	ROM
F000-FFFF	64K	System ROM